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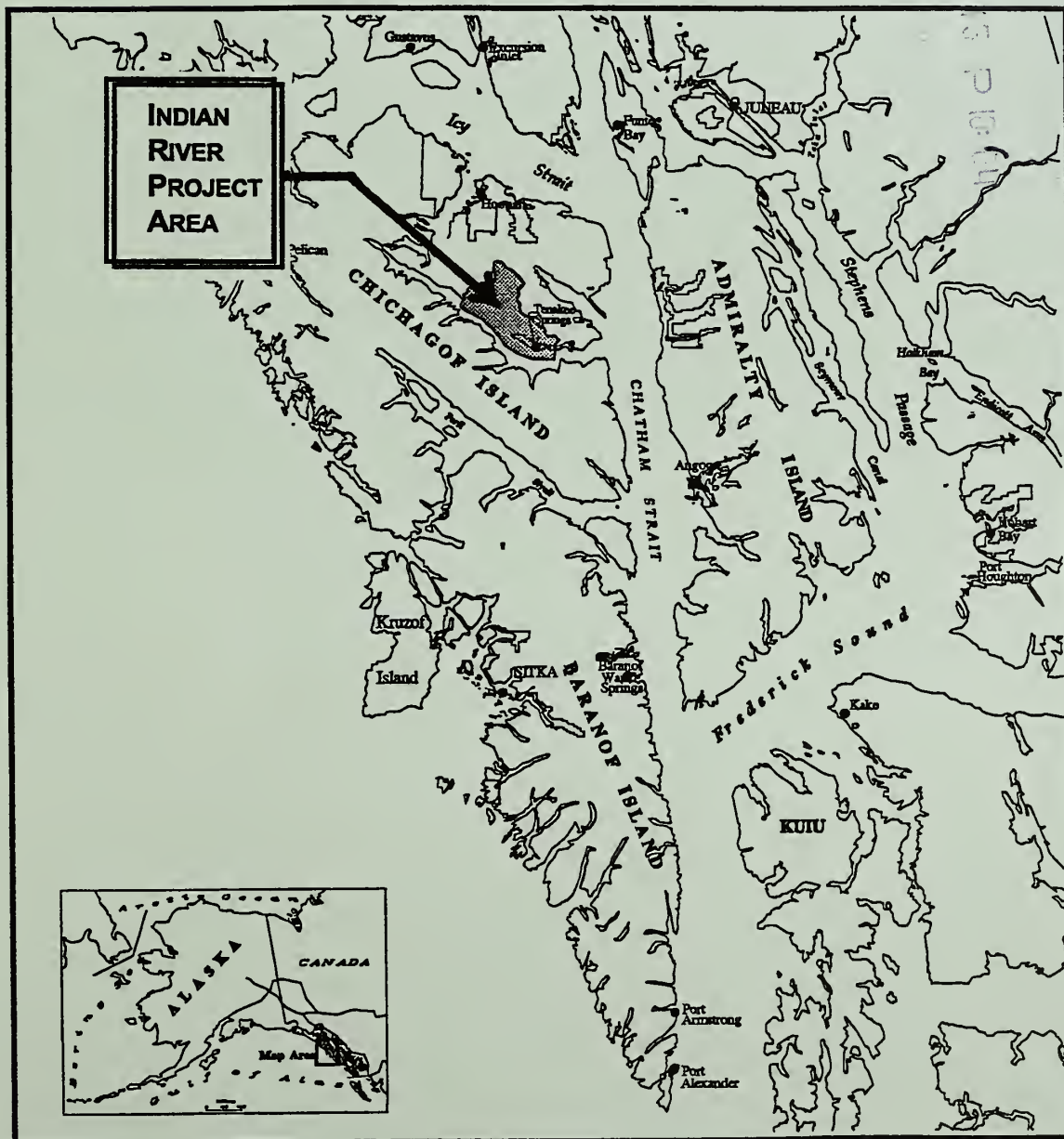
November 1997



Indian River Timber Sale(s)

Draft Environmental Impact Statement

Volume II



Appendix A

Reasons for Scheduling the Environmental Analysis of the Indian River Project Area

Appendix A

The following table shows the results of the analysis of variance for the effect of the treatment on the response variable. The results are presented in the form of a table with the following columns: Source of Variation, Sum of Squares, Degrees of Freedom, Mean Square, and F-value.

Reasons For Scheduling The Environmental Analysis Of The Indian River Project Area

Summary

Reasons for scheduling the Indian River Project Area at this time may be summarized as follows:

1. The Indian River Project Area contains a sufficient number of acres allocated to development land use designations (LUDs) to make timber harvest in the area appropriate under the 1997 Tongass Land Management Plan (TLMP). Available information indicates harvest of the amount of timber being considered for this project can occur consistent with 1997 TLMP standards and guidelines and other requirements for resource protection.
2. Areas with available timber will be necessary to consider for harvest in order to seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle, pursuant to Section 101 of the Tongass Timber Reform Act (TTRA).
3. Effects on subsistence resources are projected to differ little according to which sequence these areas are subjected to harvest. Harvesting other areas with available timber on the Tongass National Forest is expected to have similar potential effects on resources, including those used for subsistence, because of widespread distribution of subsistence use and other factors. Harvest of these other areas is foreseeable, in any case, over the forest planning horizon under the 1997 TLMP.
4. Providing substantially less timber volume than necessary to meet 1997 TLMP and TTRA Section 101 timber supply and employment opportunity objectives in order to avoid harvest in the Indian River Project Area is not necessary or reasonable.
5. It is reasonable to schedule harvest in the Indian River Project Area at the present time rather than other areas in terms of previous harvest entry and access, level of controversy over subsistence and other effects, and the ability to comply with the National Environmental Policy Act (NEPA) process and make timber available in a timely manner to meet market demand. Other areas that are reasonable to consider for harvest in the near future are the subject of other project EISs that are currently ongoing or scheduled to begin soon.
6. An infrastructure (roads, bridges, rock pits, log transfer facilities, etc.) is in place and is in need of maintenance to reduce potential resource damage. Thirty-one existing log stringer bridges require replacement with either new bridges or culverts. If these bridges are not replaced, the road network will have to be closed for safety reasons in the near future.

More detail regarding the scheduling of the environmental analysis for the Indian River Project Area is presented in this appendix in three subsections:

Southeast Alaska Timber Demand
Tongass Land Management Plan
Forest Plan Implementation

Southeast Alaska Timber Demand

Introduction.

In general, this section indicates that areas with available timber will be necessary to consider for harvest in order to seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from the forest and (2) meets the market demand from the forest for each planning cycle, pursuant to Section 101 of the Tongass Timber Reform Act.

Meeting Market Demand.

Timber demand in Southeast Alaska can vary dramatically from year to year. The level of demand is dependent on complex interactions among factors that are difficult, if not impossible, for the industry or the Forest Service to predict with accuracy. Such factors include fluctuations in interest rates, housing starts, business cycles in the United States and overseas, changes in the value of the dollar with respect to foreign currencies, changes in import tariffs, and changes in export policies in other countries.

To be responsive to market demand, the Forest Service intent is to provide an opportunity for the industry as a whole to accumulate a supply of purchased, but unharvested timber (i.e. volume under contract) equal to about three years of timber consumption. There are a number of reasons for allowing the accumulation of volume under contract. First, this allows the industry ample time to plan an orderly and systematic harvest schedule that meets all timing restrictions and permit requirements. Second, it allows the industry to better manage its financial resources and to secure financing on the basis of longer term timber supply. Third, it allows time for the necessary infrastructure (roads, log transfer facilities, and logging camps) to be put in place prior to timber harvest. Fourth, it allows the Forest Service to develop an orderly progression of timber management projects in various stages of the planning process. Finally, an ample timber supply gives the industry more opportunity to sustain itself through market cycles. If demand for pulp or lumber in any year suddenly increases, producers will have access to enough timber to respond to the increase in demand without waiting for the Forest Service or the Congress to take action. Normally, the unharvested volume under contract will be drawn down during high points in the market when mills increase production, and built up when markets are poor and production declines. In response to changes observed in the volume under contract, the Forest Service may consider adjusting its budget and timber program.

From the initiation of a timber sale project, through EIS and decision document preparation, and to the sale of timber from the project, usually requires three to four years. Such lengthy preparation time means that in order to have a stable timber supply and be able to respond to upswings in the market, there is a need to have ongoing timber management projects in various stages of the planning process. It is also necessary to have a supply of completed NEPA projects available for sale if an increased market demand is to be met.

The timber industry in southeast Alaska is now in a period of transition. Following the closings of the Alaska Pulp Corporation (APC) pulp mill and the Ketchikan Pulp Corporation (KPC) pulp mill, new mills are either under construction or are being proposed, and existing mills are being upgraded. There is currently a proposal for a veneer plant at Ward Cove in Ketchikan. This mill would use utility grade logs. The veneer could be sent to other mills for manufacture into plywood or laminated veneer lumber, or a revamped facility at the former KPC pulp mill site could manufacture the veneer into secondary products. According to Richard Leary, acting president and general manager of KPC, the plant size

would depend on the developer's degree of comfort with timber harvest levels, and a stable harvest level from the Tongass National Forest as important factors. A decision on whether to go ahead with this venture is expected by mid-November, 1997 (*Daily Sitka Sentinel* 8/15/97). A new Seley Log and Lumber Company mill is currently under construction on Gravina Island, in the Ketchikan area. The facility will employ 60 people if run at full capacity, and will house both a sawmill and secondary and tertiary manufacturing mills. Product outputs will include decking and fencing, and possibly furniture. The owner plans to begin operation in November of this year (*Ketchikan Daily News* 8/21/97). As for existing southeast Alaska mills, the Viking Lumber sawmill in Klawock, on Prince of Wales Island, recently underwent a modernizing upgrade and re-tooling; computerized equipment and a whole-log chipper were added (USDA Forest Service 1996). Also, the APC sawmill in Wrangell, according to numerous media reports, may be purchased and reopened in the near future. All of these mills will depend to some extent on a supply of timber from the Tongass National Forest.

The market demand analysis in the 1997 TLMP was based on a study by David Brooks and Richard Haynes, research scientists at the Pacific Northwest Research Station. Following the release of the 1997 TLMP, a final version of the Brooks and Haynes report was published, and it is this final report that is referenced and cited throughout this Appendix. Three scenarios (low, medium and high) were developed in the study to display the demand for Tongass National Forest timber through the year 2010 (Brooks and Haynes 1997). For the low scenario, high timber selling values, harvest costs and manufacturing costs limit Alaska's share of markets. Under the high scenario, increased harvest and manufacturing efficiency, with resulting lower costs, make Alaskan mills more competitive. Projected annual timber demand for the next decade is 113 MMBF for the low scenario, 133 MMBF for the medium, and 156 MMBF for the high scenario. These three scenarios do not consider the Seley mill that is under construction on Gravina Island, the proposed KPC veneer plant, or the possible sale and reopening of the APC sawmill in Wrangell. Nor do they account for shifting markets in Japan and the recent willingness of the Japanese to purchase Alaskan milled lumber, manufactured wood products, laminates, etc. All of these factors would lead to an increase in demand over the totals listed for the three scenarios.

The Allowable Sale Quantity (ASQ) for the Tongass averages 267 MMBF on an annual basis. However, an annual sale level of 200 MMBF or less is more likely to be offered over the next few years, given current market conditions and the transition that both the timber industry and the Forest Service are experiencing (USDA Forest Service 1997).

Tongass Land Management Plan

Chapter 1 of this EIS includes an explanation of how this project relates to the 1997 TLMP. That section describes the Land Use Designations (LUDs) which put land areas under different types of management prescriptions. Chapter 1 also explains that the Forest is divided into land areas called value comparison units (VCUs). In most cases, VCUs are roughly equivalent to large watersheds. A VCU may contain one or more LUDs.

The ASQ calculated in the 1997 TLMP is an upper limit, by decade, of the volume of timber that may be offered for sale from suitable timberland on the Forest as part of the regularly scheduled timber sale program. The current ASQ is 2.67 billion board feet per decade, which equates to an annual average of 267 million board feet. There are 676,000 acres suitable for timber management under the Forest Plan. Three LUDs (Timber Production, Modified Landscape, and Scenic Viewshed) account for nearly all of these suitable acres (USDA Forest Service 1997).

1. Cumulative Effects

The 1997 TLMP considers the cumulative effects for forest-wide acres managed for timber production for both the long-term and short-term timber sale programs. These effects are discussed at the end of their respective sections.

Analysis points to the need to schedule harvest in VCUs assigned management prescriptions which permit consideration of timber harvest, including the VCUs within the Indian River Project Area. These VCUs in the Forest plan would be needed to help meet 1997 TLMP and TTRA timber supply objectives. The forest-wide cumulative effects analysis in the 1997 TLMP supports the conclusion that this harvest can be accomplished within existing standards and guidelines and other requirements for resource protection.

2. Subsistence

With the passage of the Alaska National Interest Lands Conservation Act (ANILCA), Congress recognized the importance of subsistence resources to rural residents of Alaska. In particular, prior to any disposition of public lands, an agency must first complete a subsistence effects evaluation, including consideration of the availability of other lands (ANILCA 810 (a)).

Based on a review of available harvest volumes for each value comparison unit (VCU) on the Chatham Area of the Tongass National Forest, it appeared that in order to meet market demand, most of the Timber Production land use designations would need some level of harvest in the first decade of the 1997 Tongass Land Management Plan. A tentative sale schedule was developed, and will be updated every six months based on this analysis (Chatham Area Sale Schedule Summary, March 1997). In short, harvesting at this level to meet market demand, would indicate a level of impact to all subsistence use areas. However, the most significant impacts on subsistence deer habitat would not occur until 20 to 30 years after timber harvest when the second growth canopy closes. When those impacts to subsistence deer habitat are viewed from a reference point 20 years in the future, the particular importance of which areas are scheduled first during a 5-year period appears to be minor.

In considering rural communities that may be most affected by any proposed timber harvest in the Indian River Project Area, Angoon, Hoonah, and Tenakee Springs appear to have the strongest cultural and subsistence ties to the area. Each community has its own level of reliance on subsistence, as well as its own level of reliance on the Indian River Project Area for supplying subsistence resources, especially deer. The following information about each community's subsistence use is a summary of more detailed information provided in Chapter 3 and Appendix F of the Indian River Project EIS.

Angoon Boat access areas adjacent to or in the immediate vicinity of Tenakee Inlet is the subsistence use area used on a limited basis by the community.

Hoonah Boat access areas adjacent to or within the immediate vicinity of Tenakee Inlet are some of the subsistence use areas used by the community.

Tenakee Springs Boat access areas adjacent to or in the immediate vicinity of Tenakee Inlet, as well as trail and road access areas adjacent to or within the immediate vicinity of Sunny Cove located in the southern portion of the Project Area are some of the subsistence use areas for the community.

As a result of several considerations, including the availability of subsistence resources in non-development land use designations on Chichagof Island (such as the Kadashan and Trap Bay LUD II Areas and Kootznoowoo Wilderness adjacent to the Project Area, and Old-growth Habitat within the Project Area), standards and guidelines designed to maintain habitat (such as the 1,000-foot beach and estuary fringes), the relative independence of most communities from subsistence resources in the Project Area, as well as analysis contained in the 1997 Tongass Land Management Plan EIS and

earlier analyses, the Forest Service determined to schedule an environmental analysis of the Indian River area. Other Chatham Area projects including Eight Fathom, Northwest Baranof, Ushk Bay, Kelp Bay, Kennel/Whitestone, Finger Mountain, and Port Houghton are being implemented, or will undergo environmental analysis within the next 3 to 5 years.

Extensive forest-wide cumulative effect analysis has been included in the 1997 TLMP EIS (TLMP EIS, Part 2, pages 3-529 through 3-685). That analysis, and the tables of data with the maps in Appendix H of the 1997 TLMP EIS are incorporated by reference into this document. The data in Appendix H indicates subsistence hunting of deer and other uses in virtually every area of the Tongass National Forest that have substantial quantities of harvestable timber. The following community information is extracted directly out of the 1997 Tongass Land Management Plan EIS:

Subsistence use by Angoon households is unlikely to be directly affected by any of the [TLMP] alternatives as their most heavily used areas will be essentially unmodified under any option (1997 TLMP EIS, Part 2, page 3-532).

All [TLMP] alternatives should be able to provide habitat capability for deer hunted by Hoonah residents in the short term. However, projected deer harvest for both all rural and all hunters in the short term and Hoonah residents also in the long term exceeds 10 percent of habitat capability in Hoonah's WAAs. At some point, a restriction in hunting may be necessary (1997 TLMP, Part 2, page 3-568).

All [TLMP] alternatives should be able to provide habitat capability for deer hunted by Tenakee Springs residents, all rural hunters and all hunters in the short term. However, in the long term, the projected deer harvest for all hunters exceeds 10 percent of habitat capability and all [TLMP] alternatives may have future inadequate habitat capability for the total deer hunted. At some point, a restriction in hunting may be necessary (1997 TLMP, Part 2, page 3-658).

The analysis shown in Chapter 4 of this Project EIS is supported by the analysis shown above in the 1997 TLMP EIS. The conclusion stated above, "At some point, a restriction in hunting may be necessary.", supports the conclusion that any environmental analysis area within the Northeast Chichagof Island area would have a similar chance of having a significant possibility of a significant restriction on subsistence resources for Sitka black-tailed deer. It should also be noted that significant restrictions on the brown bear and furbearer subsistence resources currently exist on all or portions of Chichagof Island. The Northeast Chichagof Controlled Use Area is closed to the use of motorized land vehicles for brown bear hunting, or for the taking of marten, mink, and weasel. Chichagof Island is closed to the use of any motorized land vehicle for the taking of marten, mink, and weasel (USDI Federal Subsistence Board 1997).

The analyses for ANILCA section 810 are shown in the Subsistence section of Chapter 4, in this EIS. The determinations made from the ANILCA section 810 analysis and findings will be a part of the Record of Decision for this project.

Forest Plan Implementation

Review of Available Volume

A review was conducted of each VCU for available volume. This analysis was based on computer inventories and ASQ calculations used for the TLMP. All areas available for timber harvest under the 1997 TLMP can be expected to be entered for harvest sometime in the future if the plan is to be fully implemented. This analysis represents one scenario for meeting the average annual ASQ of 267 MMBF. Obviously, there can be other scenarios which harvest either more or fewer acres in the Project Area

and still attain the ASQ. Harvest projections from this analysis for the Indian River Project Area are shown in Table 1.

Table 2 displays the Tongass National Forest Sale Schedule for 1997 and the following five year period of fiscal years 1998 through 2002. As is shown in this schedule and the summary in Table 3, the timber volume projected to be offered from the Tongass is approximately 225 MMBF per year for the next five years, or about 42 MMBF less than the average annual ASQ of 267 MMBF. However, when sales with a high potential for challenge are factored in, the net probable sale offering for the next five years is approximately 123 MMBF per year. The Chatham Area portion of the ASQ for the next ten years averages 51 MMBF on an annual basis. See Appendix L of the 1997 TLMP for a more detailed discussion. It is currently projected that about 28 MMBF would be available for harvest under the Indian River Project and that the volume would be offered in three sales, one in each of years 1999, 2000, and 2002. For those three years the average annual volume sold from this project would be 9.3 MMBF per year, or approximately 18 percent of the Chatham Area's yearly ASQ.

Table 1

TLMP Projected Acres of Harvest by Decade
for the Project Area VCUs

VCU	Acres by Decade									Total Acres	Project Area Total
	1	2	3	4	5	6	7	8	9		
2041*	79	261	60	124	276		406			1,206	24**
2221*	143	120	120	200	164	396				1,143	572**
Subtotal	222	381	180	324	440	396	406	0	0	2,349	596
2200	412	210	515	303						1,440	1,440
2210		8	667	8		4				687	687
2160		110	80	283	286	293				1,052	1,052
Subtotal	412	328	1262	594	286	297		0	0	3,179	3,179
Total	634	709	1442	918	726	693	406	0	0	5,528	3,775

* Approximately 2% of VCU 2041 and 50% of VCU 2221 are in the Project Area. Acreages by decade are for the entire VCUs.

** Assumes harvest for these two VCUs is evenly distributed throughout the VCUs

Table 2

Tongass National Forest Timber Sale Schedule
Fiscal Years 1997 - 2002

Chatham Area

NEPA Project	Sale Name	Volume (MMBF)
FY 97		
SEIS	Humpback/Gallagher	21.3
SE Chichagof	Inbetween (AWRTA)	5.7
NW Baranof	Water World	8.7
NW Baranof	Duffield	20.6
SE Chichagof	Crab Bay (AWRTA)	7.8
Hoonah RD Salvage	Roadside Salvage	0.2
FY 98		
NW Baranof	Lisa Creek	6.0
NW Baranof	Schultz Cove	10.4
Port Houghton	North Houghton	11.0
Port Houghton	Little Lagoon	19.0
FY 99		
NW Baranof	St. Johns	10.7
8-Fathom	Neka	8.0
NW Baranof	Rod N' Apple	9.0
Indian River	Indian River 1	15.0
FY 00		
Port Houghton	Haystack 1	14.0
Finger Mountain	Broad Creek	21.0
Indian River	Indian River 2	9.0
FY 01		
8-Fathom	Salt Lake Bay	5.0
Finger Mountain	Crab Bay II	25.0
Kennel Creek	Kennel Creek	10.0
FY 02		
Ushk Bay	Poison Cove	19.1
Indian River	Indian River 3	10.0
Port Houghton	Haystack 2	15.0

Stikine Area

NEPA Project	Sale Name	Volume (MMBF)
FY 97		
N&E Kuiu	Rowan Settlement	8.0
South Lindenburg	South Lindenburg 1	15.0
ATC	PRD ATC	5.0
King George	King George	24.0
Froot Loops	Loop	0.5
Nootkatensis	Nootkatensis	0.6
Pathway	Pathway	0.3
Mossy	Mossy	0.3
Bowl	Bowl	0.2
Etolin	Etolin	1.0
Turn	Turn	1.2
PRD Small Sales	Misc Small Sales	2.0
FY 98		
Shamrock	Clover	12.0
N&E Kuiu	Rowan Mt.	16.0
N&E Kuiu	Crane	7.0
Todahl Backline	Todahl Backline	6.0
East Falls	East Falls	6.0
Canal/Hoya	Canal/Hoya	20.0
Nemo Loop	Nemo Loop	1.0
Donut	Donut	1.0
Salvage	Salvage	1.0
Misc Small Sales	Misc Small Sales	2.0
FY 99		
Port Houghton	Fanshaw 1	31.0
Crystal Creek	ESS	16.0
South Zarembo	South Zarembo	20.0
Kuakan	Kuakan	17.0
WRD Small Sales	Misc Small Sales	2.0
PRD Small Sales	Misc Small Sales	2.0
FY 00		
Mad Critter	Mad Critter	25.0
Woronofski	Woronofski	10.0
South Lindenberg	South Lindenberg II	10.0
Woodpecker	Woodpecker	15.0
East Kuiu	Kuiu I	22.0
WRD Small Sales	Misc Small Sales	2.0
PRD Small Sales	Misc Small Sales	2.0
FY 01		
Douglas	Douglas I	44.0
Frenchy	Frenchy	3.0
Etolin	Mosman	25.0
WRD Small Sales	Misc Small Sales	5.0
PRD Small Sales	Misc Small Sales	2.0
FY 02		
Etolin	Whaletail	25.0
East Kuiu	Kuiu II	40.0
Sumner	Sumner	6.0
WRD Small Sales	Misc Small Sales	5.0
PRD Small Sales	Misc Small Sales	3.0

Ketchikan Area

NEPA Project	Sale Name	Volume (MMBF)
FY 97		
Heceta Sawfly	Heceta Sawfly	11.2
KRD LYD	KRD LYD	0.2
Lab Bay	As Is	0.2
Lab Bay	Bob It	1.2
Lab Bay	Junction	0.3
Lab Bay	Lwr Big Creek	0.8
Lab Bay	Ridge	0.7
Lab Bay	Rock King	1.4
Lab Bay	Shakedown	3.2
Lab Bay	Woodpecker	0.3
Lanc'er Sal	Lanc'er Sal	1.1
Mtn Beaver	Mtn Beaver	1.0
Naukati/Sar	Naukati/Sar	22.9
Polk Inlet	Sentinel	5.8
Relief Sal	Relief Sal	0.3
Small Sales	Small Sales	3.2
Thorne Log Yard	Thorne Log Yd	0.1
Upper Carrol	Upper Carrol	30.0
FY 98		
Chasina	Dumpy ATC	9.7
Control Lake	Beaver Pond	0.3
Control Lake	Big Salt	13.2
Control Lake	Hard Steel	6.7
Control Lake	Lwr Beaver	0.2
Control Lake	Muskrat	0.4
Control Lake	Nth Thorne	2.7
Control Lake	Rio Beaver	5.3
Control Lake	Rush Fash	1.6
Control Lake	Rush/Angel	9.0
Control Lake	West Steel	0.2
Control Lake	Wolf Pup	1.5
Fire Cove	Fire Cove	4.0
KRD LYD	KRD LYD	0.2
Lab Bay	Perue LK	12.4
Lab Bay	Summit LK	16.4
LYD & Small Sales	LYD & Small Sales	2.0
Polk Inlet	Cable/Drop	11.0
TB Small Sales	TB Small Sales	5.0
FY 99		
Chasina	North	7.5
Chasina	Port J	11.0
Chasina	South Arm	7.9
Control Lake	Control Lake	10.0
Control Lake	Gander	5.2
Control Lake	Kogish	7.5
Control Lake	Logjam	1.8
Control Lake	Steel/Rbrts	3.9
CPOW Cleanup	B and E	2.5
CPOW Cleanup	K Jim	1.0
CPOW Cleanup	Neck Lake	1.8
CPOW Cleanup	Whale Pass	2.7

Ketchikan Area (Con't)

NEPA Project	Sale Name	Volume (MMBF)
FY 99 (Con't)		
LYD & Small Sales	LYD & Small Sales	2.0
Polk Inlet	Longline	2.9
Polk Inlet	Lowboy	1.1
Sea Level	Madder	10.0
Sea Level	Ten Pin 3	10.0
Sea Level	Toe-Dance	10.0
Small Sales	Small Sales	0.5
TB Small Sales	TB Small Sales	5.0
FY 00		
CG Small Sales	CG Small Sales	2.0
Cholmondeley	Dr. Point	16.7
Control Lake	Control Lake	12.0
Lab Bay	Thorne Island	3.5
Luck Lake	Luck Lake 1	5.0
Luck Lake	Luck Lake 2	8.0
Sea Level	Orion	20.0
Staney	Staney Creek 1	10.0
Sunny Cove	Sunny	14.0
TB Small Sales	TB Small Sales	5.0
FY 01		
Cedar Decline	Cedar	5.0
CG Small Sales	CG Small Sales	2.0
Cholmondeley	Skowl	6.7
Moirra	Perkins	23.0
Port Stewart	Mongoos	30.0
Staney	Staney Ck 2	10.0
Staney	Staney Ck 3	15.0
TB Small Sales	TB Small Sales	5.0
FY 02		
CG Small Sales	CG Small Sales	2.0
Control Lake	Control Lake	9.6
Gravina	Dutchman	8.0
Gravina	Palisade	7.0
KOS OG	KOS 1	8.0
KOS OG	KOS 3	3.0
Moirra	Black	11.3
Moirra	Frederick	11.0
N Dall	Dall	10.0
North Thorne	Thorne 1A	4.5
North Thorne	Thorne 2	5.0
Port .Stewart	Cabala	20.0
TB Small Sales	TB Small Sales	5.0

Table 3

Timber Sale Schedule Summary
Volume (MMBF) by Fiscal Year

	FY 97	FY98	FY99	FY00	FY01	FY02	FY 98-02 Ave.
Chatham Area	64	46	43	44	40	44	43
Stikine Area	58	72	88	86	79	79	81
Ketchikan Area	84	102	104	96	97	104	101
Tongass NF	206	220	235	226	216	228	225

Areas Suitable for Timber Harvest

The following is a listing and short description for the Chatham Area of existing and possible future timber sale project areas, made up of logical groupings of VCUs. This represents the majority of sites on the Chatham Area with suitable acres for timber harvest.

Kelp Bay VCUs 293, 294, 296 - 298, 314 and 315

The timber sale FEIS and Record of Decision (ROD) for this project were completed in February, 1992, with a selected alternative volume of 117 MMBF. Logging began in 1993 and has continued until the present time. The three active sales in the project are Appleton Cove Resale, Saook and Hanus Alternatives to Clearcutting (ATC). Most of the volume remaining in this project as of November, 1994 was the subject of litigation in *AWRTA v. Morrison*. Settlement of this case in May, 1996 released some of that volume for sale to independent operators.

Southeast Chichagof VCUs 227, 230 - 234, 236, 238 - 246

The ROD for 128 MMBF was signed in August, 1992. Logging under this project occurred between 1994 and 1995. As with Kelp Bay, most of the volume remaining as of November, 1994 was the subject of the *AWRTA v. Morrison* litigation. This volume is currently being re-analyzed in the Finger Mountain Timber Sale EIS (see below).

Ushk Bay VCUs 279 - 281

The ROD for this project was signed in September, 1994. The selected alternative has 67 MMBF of timber volume that would be offered in at least two sales. No timber has been sold under this project. Past harvest here is limited to scattered, A-frame beach logging and consequently there are no existing roads or LTFs in place. The project is under ongoing litigation in the *FOSEF v. Morrison* case.

Eight Fathom VCUs 193 - 198, 200 - 202, 222 - 224

The ROD for this project was signed in April, 1996, with a selected alternative volume of 104 MMBF. However, as a result of the 1997 TLMP Old-growth LUDs, the remaining available volume is approximately 45 MMBF. There is an extensive road system in place along with two existing LTFs. This project is also the subject of ongoing litigation (*Hoonah Indian Association v. Morrison et al.*). No timber has yet been sold.

Northwest Baranof VCUs 287 - 292, 299 - 302

A ROD for 67 MMBF was signed in February, 1996. A transportation infrastructure of approximately 85 miles of specified road is in place, along with eight existing LTFs. Road, bridge, and LTF construction was completed in the 1960's, and many of the roads are now overgrown with alder and brush, bridges would require replacement, and all LTFs would require reconstruction for timber sale use. No timber has been sold from this project, and it is currently under litigation (*Sitka Tribe of Alaska v. Morrison et al.*).

Port Houghton VCUs 79 - 84, (Stikine Area VCUs 85 - 89 also included)

A DEIS for this project was completed in December, 1995. The 1997 TLMP was released prior to issuance of a FEIS and ROD for Port Houghton, and for this reason, it was decided to prepare a Revised DEIS. This is currently underway. The proposed action is to harvest approximately 120 MMBF of total timber volume and construct approximately 68 miles of system road. This would be the initial entry into the

area and consequently there is no road system in place and there are no existing LTF sites. There are roads on adjoining Goldbelt Native Corporation lands on the North Shore which lead to and terminate at the LTF in Hobart Bay. These facilities would be used to transport project volume from the North shore of Port Houghton. The anticipated ROD date is August, 1998.

Finger Mountain VCU's 230 - 234, and 246

This project is in the early stages with alternatives now being developed. Harvest volume proposals will be in the range of 10 to 70 MMBF. All VCU's were also in the Southeast Chichagof project, and as mentioned above, volume remaining from that project is being re-analyzed here. A road network and LTFs are in place. August, 1998 is the anticipated ROD date.

Kennel/Whitestone VCU's 207 - 209, 212, 215, 217 and 218

Analysis and field work for this project are scheduled to begin in late spring, 1998. Early projections are for a FEIS and ROD in 2000. Initial estimates of volume to be made available are approximately 30 MMBF.

Windham Bay VCU's 68 - 70, 72 -74

This area is currently under consideration for a timber sale project. The area has had no previous harvest and therefore, there are no existing roads or LTFs. There are no estimates yet of a NEPA start date or anticipated volume to be made available, but any sales from this project would be offered after the year 2002.

Homeshore VCU's 116 - 120 and Kruzof VCU's 303, 306 - 307

Both areas are being considered for future timber sales. Both have had prior entries. There is a limited road network in place in Homeshore and a fairly extensive road network and LTFs in place in the Kruzof area. As with Windham Bay, there are no estimates yet of a NEPA start date or anticipated volume to be made available, but any sales from either project would be offered after the year 2002.

Reasons for Scheduling the Indian River Project for Environmental Analysis

In addition to the Indian River Project Area's relative ability to provide timber, other factors considered in scheduling it for environmental analysis at its projected timber volume level included:

- 1) This harvest level is consistent with the 1997 TLMP.
- 2) Sufficient volume has been determined to be available in the project area. The initial entry in this area took place between 1977 and 1986, and the regenerated stands from this entry would be at least 12 years of age at the time of the first planned sale from this project in 1999. Certified silviculturists examined harvest units from the first entry and all units are stocked with trees of desirable species averaging at least five feet in height. Therefore, the units are no longer considered openings and adjacent harvest is permitted (USDA Forest Service 1997).
- 3) There are 23 miles of specified road in place with 31 log stringer bridges, 24 of which need to be replaced with new bridges and the remaining seven which can be replaced with culverts. Unless these bridge replacements are made, the road system will have to be closed in the near future for safety reasons.
- 4) The number and location of Log Transfer Facilities are sufficient to handle this volume of timber within a three year time frame. A drive down ramp facility can be fairly easily constructed at the existing Sunny Cove LTF site. There is currently a MOU between the City of Tenakee Springs and the Forest Service for use of this site for timber sale operations.

- 5) There are logging camps within the area to handle this volume.

Substantial changes in timber demand or other circumstances could affect the rate at which various areas proceed through the NEPA process or the timing of actual timber sale offerings, but these changes are not expected to alter the sequence for initiating and completing the NEPA process for various areas. Time periods of relatively low market demand provide an opportunity to increase available timber supply in anticipation of cyclical higher demand periods. All areas in which commercial timber harvest is authorized under the TLMP are expected to receive some level of timber harvest at some time if the Forest Plan is to be fully implemented. Total environmental impacts viewed in the long term are not expected to differ substantially depending upon the order in which different areas are entered. The "No-Action" Alternative of not proceeding with further harvest at the present is considered in detail in each timber sale project NEPA process. But generally, projects farthest along in the NEPA process are the most efficient and logical to consider for implementation first in order to meet timber supply, timber sale program, and Forest Plan objectives.

Appendix B

Biological Assessment and Biological Evaluation

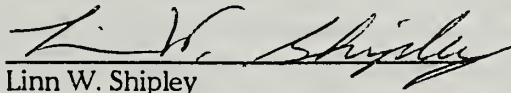
ALDOUS HUXLEY

THE DOOR INTO HEAVEN
AND THE DOOR OUT OF HEAVEN

**BIOLOGICAL ASSESSMENT AND BIOLOGICAL EVALUATION
FOR
ENDANGERED, THREATENED, SPECIES OF CONCERN, AND SENSITIVE
VERTEBRATE SPECIES
WHICH MAY OCCUR IN THE INDIAN RIVER TIMBER SALE(S) AREA**

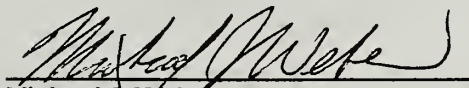
11/20/96
Date

PREPARED BY:



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Chatham Area Supervisor's Office

INTRODUCTION

This Biological Assessment (BA) and Biological Evaluation (BE) was prepared to fulfill requirements of the Endangered Species Act of 1973, as amended and Forest Service endangered threatened, and sensitive animal species policy (FSM 2670). The purpose of a BA is to determine whether the proposed action (in terms of the action alternatives in the Environmental Impact Statement) is likely to affect an endangered or threatened species, or species of concern. The purpose of a BE is to analyze the possible effects of the proposed action (in terms of the action alternatives in the Environmental Impact Statement) on endangered, threatened, species of concern, and sensitive animal species.

PROJECT DESCRIPTION

PROJECT OVERVIEW

The Tongass National Forest, Sitka and Hoonah Ranger Districts, proposes to harvest 25 to 45 million board feet (MMBF) of timber from the Indian River Project Area. One or two Log Transfer Facilities (LTF) and up to 35 miles of road would be constructed or reconstructed to allow removal of the timber.

PROJECT LOCATION

The Indian River Project Area is located in the Tongass National Forest on Chichagof Island, approximately 56 air miles north of Sitka (Figures 1 and 2). The Project Area encompasses approximately 39,000 acres.

ALTERNATIVES

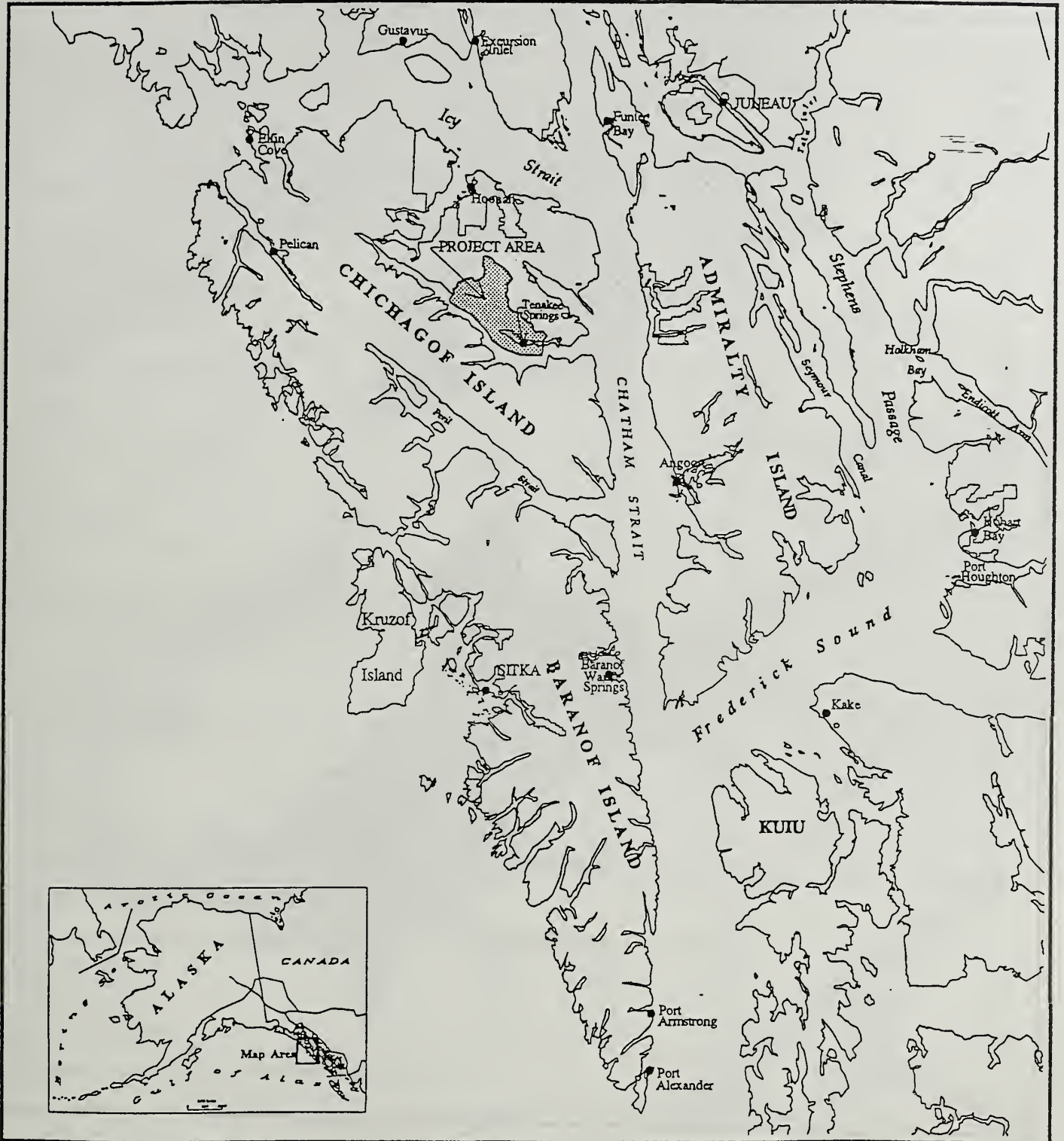
A total of six alternatives, including the No Action Alternative, were developed and evaluated. The action alternatives were each developed to be as site-specific as possible. Collectively, the action alternatives were formulated to explore ways to satisfy public concerns and resolve issues of concern, while responding to the purpose and need for the project.

The five action alternatives differ primarily in harvest intensity (i.e., number of harvest units), miles of road, and number of LTFs. The harvest systems (i.e., clearcut vs. group selection) and yarding systems (i.e., helicopter vs. cable system) are unit-specific and may vary between alternatives. Table 1 summarizes the features of each alternative.

WILDLIFE SPECIES

After consulting (Appendix A) with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and the Alaska Region Sensitive Species list (FSM 2670), Table 2 was generated. This table describes the endangered, threatened, species of concern, and sensitive species which may occur in the Project Area.

Vicinity Map

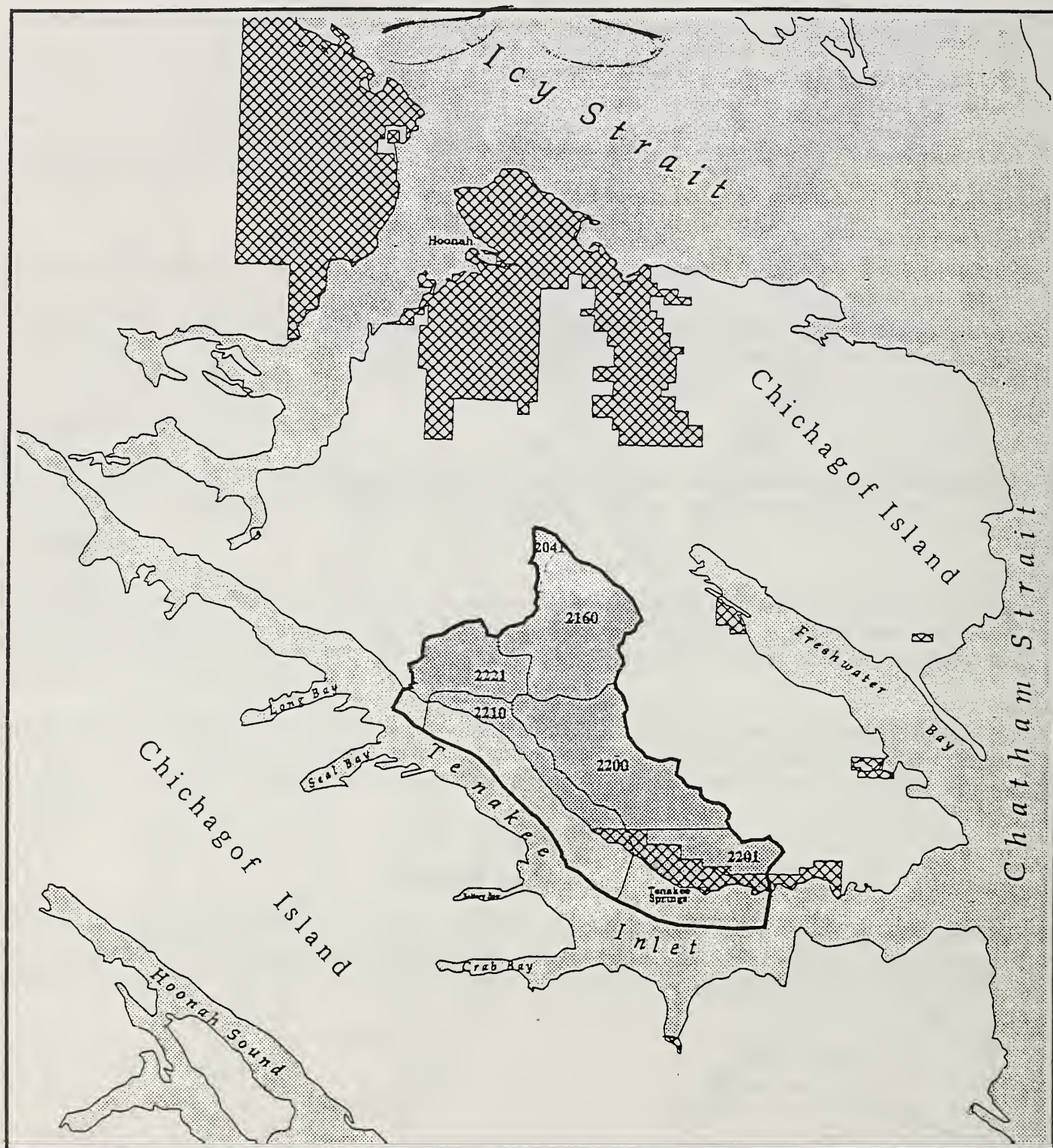





Project Area



Scale in Miles





-  Other Ownership
-  Project Area
-  VCU Boundaries
- 2160** VCU Number

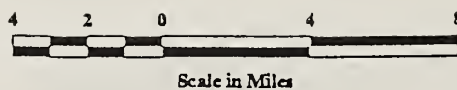


Table 1
Summary of Action Alternatives

	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Sawlog Volume (mbf)	0	20,104	24,165	20,859	20,736	31,964
Sawlog & Utility Volume (mbf)	0	25,130	30,252	26,074	25,920	39,955
Proposed Harvest Acres	0	2,050	1,856	1,751	1,665	2,521
Number of Units	0	86	82	72	78	107
Proposed Harvest by Logging System						
Cable Acres	0	327	655	513	546	687
(percent)	0	(16)	(35)	(29)	(33)	(27)
Cable Volume (mbf)	0	5,543	12,611	10,221	10,384	13,858
		(22)	(42)	(40)	(40)	(35)
Cable/Helicopter Acres	0	63	121	58	89	121
(percent)	0	(3)	(7)	(3)	(5)	(5)
Cable/Helicopter Volume (mbf)	0	1,264	2,348	1,084	1,802	2,032
		(5)	(8)	(4)	(7)	(5)
Helicopter Acres	0	1,632	990	1,096	975	1,576
(percent)	0	(80)	(53)	(63)	(59)	(63)
Helicopter Volume (mbf)	0	17,941	13,602	13,116	12,597	21,413
		(71)	(45)	(50)	(49)	(53)
Shovel Acres	0	28	90	84	55	137
(percent)	0	(1)	(5)	(5)	(3)	(5)
Shovel Volume (mbf)	0	382	1,691	1,653	1,137	2,652
		(2)	(5)	(6)	(4)	(7)
Proposed Harvest Acres by Harvest Method						
Clearcut with Green Tree Retention	0	813	1,173	991	1,115	1,460
(percent)	0	(39)	(63)	(57)	(67)	(58)
Overstory Removal	0	325	186	151	159	244
(percent))	0	(16)	(10)	(9)	(10)	(10)
Patch Clearcut	0	118	167	120	85	493
(percent)	0	(6)	(9)	(7)	(5)	(19)
Group Selection	0	734	150	326	131	95
(percent)	0	(36)	(8)	(18)	(8)	(4)
Single Tree Selection	0	60	180	163	175	229
(percent)	0	(3)	(10)	(9)	(10)	(9)
Proposed Harvest Volume by Harvest Method (mbf)						
Clearcut with Green Tree Retention	0	16,710	24,446	20,491	21,497	29,946
Overstory Removal	0	4,141	2,435	1,905	2,177	4,048
Patch Clearcut	0	819	1,435	1,048	433	3,599
Group Selection	0	2,846	538	1,340	506	382
Single Tree Selection	0	614	1,398	1,290	1,307	1,980
Proposed Roads and Log Transfer Facilities (LTFs)						
New Road Miles	0	7.8	9.5	9.2	8.4	9.7
Reconstruction Miles	0	21.6	21.7	10.7	21.6	22.1
Temporary Road Miles	0	1.9	3.1	2.4	2.6	3.5
Number of LTFs	0	2	1	1	1	1

Source: G. Peterson 1996

Table 2
Threatened, Endangered, Species of Concern, and Sensitive Animal Species Which May Occur in the Indian
River Project Area

Common Name	Scientific Name	Federal Status	Alaska Region Status
Humpback whale	<i>Megaptera novaengliae</i>	E	--
Steller sea lion	<i>Eumetopias jubatus</i>	T	--
American peregrine falcon	<i>Falco peregrinus anatum</i>	E	--
Marbled murrelet	<i>Brachyramphus marmoratus</i>	C	--
Harlequin duck	<i>Histrionicus histrionicus</i>	C	--
Northern goshawk	<i>Accipiter gentilis</i>	C	S
Olive-sided flycatcher	<i>Contopus borealis</i>	C	--
Osprey	<i>Pandion haliaetus</i>	--	S
Trumpeter swan	<i>Cygnus buccinator</i>	--	S
Peale's peregrine falcon	<i>Falco peregrinus pealei</i>	--	S

Source:

E = Endangered. Any species in danger of extinction throughout all or a significant portion of its range.

T = Threatened. Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

C = Species of Concern (former Category 2 Candidate species). Species for which there is information in the scientific literature indicating that populations or habitat may be decreasing significantly, but further evaluation is needed.

S = Sensitive species. Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by: a.) significant current or predicted downward trends in population numbers or density, b.) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution (FSM 2670).

Table 2
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Harlequin duck	<i>Histrionicus histrionicus</i>	C	--
Northern goshawk	<i>Accipiter gentilis</i>	C	S
Olive-sided flycatcher	<i>Contopus borealis</i>	C	--
Osprey	<i>Pandion haliaetus</i>	--	S
Trumpeter swan	<i>Cygnus buccinator</i>	--	S
Peale's peregrine falcon	<i>Falco peregrinus pealei</i>	--	S

Source:

E = Endangered. Any species in danger of extinction throughout all or a significant portion of its range.

T = Threatened. Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

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HUMPBACK WHALE

Distribution and Populations

The humpback whale is an endangered species. It occurs in all oceans of the world. In winter, most humpback whales occur in temperate and tropical waters of both hemispheres. In summer, most are in waters of high biological productivity, usually in the higher latitudes.

The humpback whale is the most abundant of the eight endangered species of whales that occur in Southeast Alaskan waters. Humpback whales are regularly sighted in the Inside Passage and coastal waters from Yakutat Bay south to Queen Charlotte Sound (NMFS 1991). They feed in Southeast Alaska from about May through December, although some have been seen every month of the year (Baker et al. 1985). Peak numbers of humpback whales are usually found in near-shore waters during late August and September, but substantial numbers usually remain until early winter. An estimated 300 to 350 humpback whales inhabit Southeast Alaska waters during the summer and fall (Baker et al. 1985).

The local distribution of humpback whales in Southeast Alaska appears to be correlated with the density and seasonal availability of prey, particularly herring and krill (Bryant et al. 1981, Baker et al. 1985). Important feeding areas in Southeast Alaska include Glacier Bay, Icy Strait, Stephens Passage, Frederick Sound, Seymour Canal, and Sitka Sound (Baker et al. 1985, Straley 1990).

Determination of Effects

The proposed activities that potentially could result in impacts to humpback whales are the use of camps, LTFs, and the movement of log rafts and barges.

Operation of LTFs and other docking facilities are restricted to small, very localized areas of the marine environment. Operation of LTFs is unlikely to affect prey availability for humpback whales. LTF permits require that remedial action be taken if monitoring determines that water quality has been impacted during construction and operation of LTFs. As a result, no impacts are anticipated to the marine environment which could affect humpback whale prey species.

Humpback whales could be disturbed by increased boat traffic associated with LTFs. Log barge towing occurs at relatively constant speeds and directions, and is less likely to elicit avoidance behavior from whales than other types of boating activity. Recreational boating by LTF workers involves frequent changes in speed and direction. Disturbance impacts would be localized and highly random, depending on many factors, such as the size of the bay, water depth, number of boats, and individual behavioral responses of humpback whales. Behavioral responses could include sounding, breaching, evasive underwater maneuvers, and maintaining distance. The likelihood of a boat collision with a humpback whale is remote and predicting such a random event would be difficult.

Cumulative effects

There will be no measurable cumulative effects.

Findings

There will be no measurable effect to the species or their habitat.

AMERICAN PEREGRINE FALCON

Distribution and Populations

The American peregrine falcon is an endangered species. It nests in interior Alaska and occurs in Southeast Alaska on a short term basis during spring and fall migration. During migration, peregrine falcons forage in areas of high prey availability, such as seabird rookeries and waterfowl concentration areas (Armstrong 1990).

Determination of Effects

There are no seabird rookeries in the Project Area, but waterfowl may concentrate in estuaries within the Project Area. The American peregrine falcon would not be affected as a result of the proposed project since habitats used during migration (estuaries with concentrated waterfowl) would not be effected by the project.

Cumulative Effects

There will be no measurable cumulative effects.

Findings

There will be no measurable effect to the species or their habitat.

STELLER (NORTHERN) SEA LION

Distribution and Populations

The Steller sea lion is a threatened species. The range of the Steller sea lion extends along the rim of the North Pacific Ocean from eastern Asia, along the coast of Alaska, and south to California. The centers of abundance and distribution are the Gulf of Alaska and Aleutian Islands. Population levels have declined in portions of Alaska, but are fairly stable and may have even increased in Southeast Alaska (Zimmerman 1993). Steller sea lion critical habitat has been designated by the National Marine Fisheries Service (Zimmerman 1996); however, none of it is located in Tenakee Inlet.

Steller sea lion habitat includes marine and terrestrial areas that are used for a variety of purposes. Adult Steller sea lions congregate at rookeries for pupping and breeding. Rookeries generally are located on relatively remote islands, often in exposed areas where access by humans and mammalian predators is difficult. Steller sea lions eat a variety of fish and invertebrates. Potential prey items in marine waters of the Project Area include Pacific cod, Pacific herring, and salmon.

Determination of Effects

The proposed activities that potentially could result in impacts to Steller sea lions are the use of camps, LTFs, and the movement of log rafts and barges. Operation of LTFs and other docking facilities are restricted to small, very localized areas of the marine environment.

LTF operation is unlikely to affect prey availability for Steller sea lions because LTF permits require that remedial action be taken if monitoring determines that water quality has been impacted during construction and operation of LTFs.

Disruption of feeding activities may occur due to increased boating, recreation, aircraft, LTFs, and log barge towing in the area, but the frequency and effect of these interactions would be difficult to predict and is not expected to be significant. These activities may occasionally effect individuals but would not result in a negative effect on the species.

Cumulative Effects

There will be no measurable cumulative effects.

Findings

There will be no measurable effect to the species or their habitat.

HARLEQUIN DUCK

Distribution and Populations

The harlequin duck is a species of concern. The harlequin duck is a fairly common year-round resident in Southeast Alaska (Armstrong 1990). Harlequin ducks winter in coastal waters and nest along inland streams. Nests are well hidden and often difficult to locate. Nests have been found under root overhangs in creek banks, on cliff ledges above streams, on logjams, and in tree cavities (Cassirer and Groves 1991).

During winter, harlequin ducks are common to abundant in coastal waters of Southeast Alaska (Armstrong 1990). They winter close to reefs, rocky islands and cobble beaches, usually in small groups, but occasionally in rafts of several hundred or more.

Determination of Effects

Harlequin duck habitat is present in the Project Area. No surveys were conducted as timber harvesting activities would not occur within 100 feet of any stream which contains fish habitat. These streams represent the majority of potential harlequin duck habitat and therefore would not be affected.

Road crossings at streams may displace individuals, but the population would not be affected. Appropriate contract clauses (such as C6.01 - Interruption or Delay of Operations) will be implemented if nesting Harlequin ducks are located.

Wintering habitat, which is found in coastal waters, also would not be affected as no proposed activities would occur in winter habitat areas.

Cumulative effects

There has been a loss of habitat due to past timber harvest which took place along streams of the Project Area. The proposed action would slightly add to this impact at stream road crossings. There will be future timber sales planned in the Project Area; however, current standards and guidelines, policy and direction, and legal requirements are adequate to maintain harlequin duck populations and habitat.

Findings

The project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

MARBLED MURRELET

Distribution and Populations

The marbled murrelet is currently listed as a species of concern. It occurs along the Pacific Coast of North America and Asia from south-central California to the Barren and Aleutian Islands in Alaska, and from the Sea of Okhotsk, Kamchatka, and the Commander Islands, south to Korea, Japan, and the Kurile Islands (Marshall 1988).

In Alaska, marbled murrelets are found along the coast from Southeast Alaska to the western Aleutian Islands. The highest numbers occur in Southeast Alaska where the population during the breeding season is estimated to be 96,000 marbled murrelets (Piatt and Ford 1993). This population comprises approximately 63 percent of the total estimated number of marbled murrelets in the entire state of Alaska.

Marbled murrelets forage year round in nearshore marine waters, congregating in well-defined areas where food is abundant. Marbled murrelets nest in old-growth forest habitat. Suitable nest trees have large branches, deformities, or other structures that provide a platform for a nest. Nests are generally located high above ground with good overhead protection. Most nests have been found in larger forest stands with sufficient interior forest habitat; these habitat conditions minimize the risk of predation at the nest and provide suitable climatic conditions for nesting (U.S. Fish and Wildlife Service 1994).

Marbled murrelets nest in old-growth forest habitat in the Project Area. All old-growth forest in the Project Area is adjacent to the marine environment where marbled murrelets occur, and therefore, is assumed to provide suitable nesting habitat for marbled murrelets.

No nesting activity has been documented in the Project Area (Mendenhall 1992) and no nesting surveys have been

conducted. However, nearshore marine surveys and dawn watches were conducted in the Project Area by Forest Service biologists.

Nearshore marine surveys were conducted in July of 1994 along the entire coast of the Project Area (approximately 58 km) according to established survey protocols (Ralph and Miller 1991). A total of 190 marbled murrelets were counted (Appendix B).

Two dawn watches were conducted in 1994 and 8 dawn watches occurred in 1995 according to established survey protocols (Paton, et al. 1990). A total of 691 marbled murrelets were counted (Appendix B).

Determination of Effects

Harvesting of old-growth timber in the Project Area is likely to result in loss of nesting habitat for marbled murrelets. Available evidence from Southeast Alaska suggests that marbled murrelets are dependent on old-growth forests for nesting habitat (Quinlan and Hughes 1990). Evidence from California, Oregon and Washington suggests that declines in murrelet populations may be related to the loss of mature and old-growth forest habitat (Carter and Morrison 1992).

All action alternatives would harvest stands which may be capable of providing nesting habitat for marbled murrelets. The amount of old-growth currently being used by marbled murrelets is unknown. The factors currently limiting marbled murrelets in Southeast Alaska have not been identified. Assuming that availability of nesting habitat is a limiting factor for the population, then a reduction in available nesting habitat could result in a reduction of the population. However, this relationship has not been quantified in Southeast Alaska.

Habitat fragmentation or increased edge would likely increase the estimated adverse effect of the action alternatives on marbled murrelets. Habitat fragmentation results in increased predation on nests of forest birds, and also allows for increased populations of predators. Corvids (i.e., crows, ravens, and jays) are edge species that would increase in numbers as edge increases. Marbled murrelet nests are highly susceptible to predation, primarily by corvids (Nelson 1993). Thus, it follows that habitat fragmentation has an effect on marbled murrelet nesting success. The size of old-growth forest patches is also important because marbled murrelets nest in loose colonies or aggregations.

A strategy for maintaining viable populations of old growth dependent species was developed which deferred areas from timber harvest. Figure 2 displays proposed Habitat Conservation Areas (HCA). The proposed large and medium-sized HCAs within the project boundary, have been deferred from harvest this entry. Appropriate contract clauses (such as C6.01 - Interruption or Delay of Operations) will be implemented if nesting marbled murrelets are located. With these reserves in place it is believed that, although individuals may be affected, this project would not result in a trend toward federal listing of marbled murrelets.

Cumulative effects

Approximately 11 percent of the old growth (8000 board feet per acre or greater) acres existing in 1956 have been removed during previous harvest. This project could remove an additional 9 percent of the existing old growth habitat acreage. There will be future timber sales planned in the Project Area; however, current standards and guidelines, policy and direction, and legal requirements are adequate to maintain viable marbled murrelet populations and habitat.

Findings

This project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

NORTHERN GOSHAWK

Distribution and Populations

The northern goshawk is a species of concern and is also identified as a sensitive species by the Alaska Region of the Forest Service. It occurs in forested regions throughout the higher latitudes of the northern hemisphere. The species is uncommon in Southeast Alaska (Armstrong 1990).

The northern goshawk nests in old-growth forest habitat in Southeast Alaska. Suitable nesting habitat consists of forest stands at least 20 to 30 acres in size, with large trees, closed canopy, and low understory vegetation (USDA Forest Service 1991). These structural characteristics are important for providing nest and perch sites, for facilitating flight beneath the canopy and between trees, and perhaps for providing prey species habitat (Crocker-Bedford 1993).

Surveys Conducted

In an effort to avoid timber harvest near goshawk nesting sites, Forest Service biologists conducted surveys of proposed timber harvest units and road locations according to established protocols (Forest Service 1992). Surveys were conducted in 1994, 1995, and 1996 (Appendix C). Goshawk surveys were initiated based on probability of nesting habitat, previous goshawk observations, and areas not previously surveyed. The surveys were then prioritized based on probability of nesting habitat. Probability was determined based on attributes of known nest sites in Southeast Alaska. Attributes included areas below 1000 feet elevation, timber volume class greater than 8000 board feet/acre, slopes less than 75%, with landforms of broken mountainslope or hillslope, hills, footslope, or valley bottom.

A goshawk was seen in the 10-Mile Creek drainage in 1993 and 1994 (pers. comm., P. Mooney). In 1995, a plucking post, two inactive nest sites, and a possible goshawk response to recorded calls was documented in the vicinity of units 6041, 6042, and 6061. Also in 1995, a nest with two adult raptors identified as goshawks or red-tailed hawks was located west of the 7500 road, approximately 0.5 mile south of the intersection with the 7502 road. Additional surveys need to be made in these areas to determine if there are active nests. If an active nest site is located, standards and guidelines, policy, and contract clauses are adequate to insure protection of the site and nesting birds.

Determination of Effects

Up to 9 percent of the remaining old growth (8000 board feet per acre or greater) acreage would be removed from the Project Area.

Based on three years of intensive surveys, there is high confidence that timber harvest will not remove any active nest trees. There will be a reduction in the number of potential nest trees and a decrease in the amount of forage area for goshawks.

Other impacts of timber harvest may include fragmentation, reduced foraging habitat quality, reduced prey densities, and increased competition from red-tailed hawks and other raptors (Crocker-Bedford 1990).

A strategy for maintaining viable populations of old growth dependent species was developed which deferred areas from timber harvest. Figure 3 displays proposed Old Growth Reserves (OGR). The proposed large and medium-sized OGRs within the project boundary, have been deferred from harvest in this project. With these reserves in place it is believed that, although individuals may be affected, this project would not result in a trend toward federal listing of northern goshawks. Appropriate contract clauses (such as C6.01 - Interruption or Delay of Operations) will be implemented if nesting northern goshawks are located.

Cumulative effects

Approximately 11 percent of the old growth (8000 board feet per acre or greater) acres existing in 1956 have been removed during previous harvest. This project could remove an additional 9 percent of the existing old growth habitat acreage. There will be future timber sales planned in the Project Area; however, current standards and guidelines, policy and direction, and legal requirements are adequate to maintain viable northern goshawk populations and habitat.

Findings

This project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

OLIVE-SIDED FLYCATCHER

Distribution and Populations

The olive-sided flycatcher is a species of concern. It is uncommon in Southeast Alaska (Armstrong 1990). This species nests in a variety of habitats including coniferous forest, open woodland, and muskegs. In Southeast Alaska, this species occurs primarily in second-growth forest and alder habitats, and occasionally in muskegs.

Determination of Effects

Short-term loss of habitat and displacement of individuals would occur from construction of roads through muskegs and clearing of alder from existing roads. In the long term, timber harvest would increase the amount of second growth, alder, and edge habitats. Impacts to the olive-sided flycatcher may be beneficial in the long term.

Cumulative effects

There will be no measurable adverse cumulative effects.

Findings

This project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

OSPREY

Distribution and Populations

The osprey is identified as a sensitive species by the Alaska Region of the Forest Service. Ospreys are rare in Southeast Alaska (Armstrong 1990) and the only known nest sites in Southeast Alaska are located in the Stikine Area (USDA Forest Service 1991). There have been no reported observations in the Project Area. Because of this limited distribution in Southeast Alaska, ospreys are not expected to occur in the Project Area.

Determination of Effects

Ospreys would not be affected by the proposed action as this species is unlikely to occur in the Project Area.

Cumulative effects

There will be no measurable cumulative effects.

Findings

There will be no measurable impact on the species or their habitat.

PEALE'S PEREGRINE FALCON

Distribution and Populations

The Peale's peregrine falcon is identified as a sensitive species by the Alaska Region of the Forest Service. They nest along the outer coast of the Gulf of Alaska. Nests are generally associated with large seabird colonies (USDA Forest Service 1991). The Project Area is not located along the outer coast, and there are no seabird colonies in the Project Area; therefore, Peale's peregrine falcons are not expected to occur in the Project Area.

Determination of Effects

Peale's peregrine falcon would not be affected by the proposed action as this species is unlikely to occur in the Project Area.

Cumulative effects

There will be no measurable cumulative effects.

Findings

There will be no measurable impact on the species or their habitat.

TRUMPETER SWAN

Distribution and Populations

The trumpeter swan is identified as a sensitive species by the Alaska Region of the Forest Service. They are known to nest at Yakutat and in the Chilkat Valley in Southeast Alaska. Trumpeter swans from other parts of Alaska migrate through and winter in Southeast Alaska. They are considered rare in Southeast Alaska in winter, except in Blind Slough near Petersburg (Armstrong 1990). They may use pond habitats (Armstrong 1990) in the Project Area but it is unlikely

that they would overwinter because the ponds in the Project Area are small in size and number and usually freeze in the winter.

Determination of Effects

Individual trumpeter swans occurring in the Project Area could be temporarily disturbed by human activities associated with timber harvesting and road construction. Appropriate contract clauses (such as C6.01 - Interruption or Delay of Operations) will be implemented if nesting trumpeter swans are located. No other measurable impacts are expected to occur from the proposed action.

Cumulative effects

There will be no measurable cumulative effects.

Findings

There will be no measurable impact on the species or their habitat.

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BIOLOGICAL EVALUATION FOR PLANTS

Indian River Timber Sale Area

Hoonah and Sitka Ranger Districts
Tongass National Forest

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Date: 9/24/96

BIOLOGICAL EVALUATION FOR PLANTS
Indian River Timber Sale Area
Hoonah and Sitka Ranger Districts, Tongass National Forest

INTRODUCTION

The Indian River Timber Sale consists of proposed timber harvest units, haul roads, log transfer facilities, and related activities on the southern part of the northeastern peninsula of Chichagof Island. The Project Area formerly was part of the Alaska Pulp Company long-term timber sale contract area, but is now being considered under the independent sale program of the Chatham Area. Details of the project, six proposed alternatives, potential effects, and maps are given in the Draft Environmental Impact Statement (DEIS; USDA FS in prep.).

The purpose of a Biological Evaluation (BE) is to analyze the possible effects of the proposed activities on threatened, endangered, proposed, and sensitive plants.

PROJECT DESCRIPTION

The alternatives range from no action to a maximum of 2,517 harvest acres, 9.7 miles of new roads, and 22.1 miles of reconstructed existing roads. Timber harvest is proposed to include several harvest systems, such as helicopter, cable, and shovel yarding. Proposed harvest types include clearcuts with reserves, patch clearcuts, group selection, shelterwood, individual tree mark, and overstory removal. See the DEIS for a summary of proposed actions by alternative.

SENSITIVE PLANTS

The only plant federally listed or proposed by the U.S. Fish and Wildlife Service in Alaska is *Polystichum aleuticum*, which is endangered. It is only known from Adak Island and is not expected to occur in the Project Area.

Twenty-two vascular plants are designated as sensitive in the Alaska Region (Appendix A). Sensitive plants known or suspected to occur on the Hoonah and Sitka Ranger Districts of the Tongass National Forest are shown in Table 1. Two plants are designated Species of Concern by the US Fish and Wildlife Service. Species of Concern are those taxa for which the Service has available scientific information which indicates populations may be declining or facing threats. These were formerly called Category 2 Candidate Species (US Fish and Wildlife Service 1996).

Table 1. Sensitive Plants Known or Suspected to Occur on Hoonah and Sitka RDs		(Stensvold 1995)
Norberg arnica (<i>Arnica lessingii</i> ssp. <i>norbergii</i>)		suspected
Goose-grass sedge (<i>Carex lenticularis</i> var. <i>dolia</i>)†		known
Pretty shooting star (<i>Dodecatheon pulchellum</i> ssp. <i>alaskanum</i>)		known
Northern rockcress (<i>Draba borealis</i> var. <i>maxima</i>)		suspected
Kamchatka rockcress (<i>Draba kamtschatica</i>)		suspected
Davy mannagrass (<i>Glyceria leptostachya</i>)		suspected
Wright filmy fern (<i>Hymenophyllum wrightii</i>)		known
Truncate quillwort (<i>Isoetes truncata</i>)		suspected
Calder lovage (<i>Ligusticum calderi</i>)		suspected
Choris bog orchid (<i>Platanthera chorisiana</i>)		known
Bog orchid (<i>Platanthera gracilis</i>)		suspected
Loose-flowered bluegrass (<i>Poa laxiflora</i>)		known
Kamchatka alkali grass (<i>Puccinellia kamtschatica</i>)		suspected
Unalaska mist-maid (<i>Romanzoffia unalaschcensis</i>)		known
Queen Charlotte butterweed (<i>Senecio moresbiensis</i>)		suspected
Circumpolar starwort (<i>Stellaria ruscifolia</i> ssp. <i>aleutica</i>)		suspected
Smooth-fruited netleaf willow (<i>Salix reticulata</i> ssp. <i>glabellcarpa</i>) *		suspected
Ascending moonwort (<i>Botrychium ascendens</i>) *†		suspected

*Likely to be added to the Region 10 Sensitive Species list

† US Fish and Wildlife Service Species of Concern

PRE-FIELD REVIEW OF EXISTING INFORMATION

A pre-field review of existing information concerning the plants listed above was conducted for the Project Area. This review included the Regional Forester's Sensitive Species List; Alaska Natural Heritage Program (AKNHP) database records; Chatham Area Integrated Resource Inventory database; botanical literature (titles are listed in the references section of this report); and consultation with Mary Stensvold, the Alaska Region Botanist. Proposed and existing road and unit locations, aerial photographs, and the common land unit layer (mapping polygons based on landform, slope, geology, soils, and vegetation) of the Chatham Area Geographic Information System (GIS) were also reviewed.

PLANTS KNOWN

Previously documented sightings of sensitive plants in or near the Project Area are shown in Table 2.

Table 2. Documented Sensitive Plant Sightings near the Project Area		(Stensvold 1995; USDA FS field recon. 1995, 1996)
Taxon	Location	Approx. Minimum Distance to Project Area
<i>Carex lenticularis</i> var. <i>dolia</i>	Hoonah Ranger District	not available (not in Project Area)
<i>Dodecatheon pulchellum</i> ssp. <i>alaskanum</i>	Hoonah	12 miles
<i>Platanthera chorisiana</i>	W. side Lisianski Inlet, Chichagof Island	25 miles
	Tonalite Creek, Chichagof Island	10 miles
	Indian River, Chichagof Island	in Project Area
	Tough Choice Creek, Chichagof Island	10 miles
<i>Poa laxiflora</i>	Hoonah main street	12 miles

PLANTS SUSPECTED. The following general habitats (or plant communities) occur in the Project Area: open and closed coniferous forest (various plant associations including western hemlock series, Sitka spruce series, mixed conifer series, western hemlock-yellowcedar series, mountain hemlock series), deciduous forest (red alder), forest edge, rocky areas, rock outcrops, ridgetops, cliffs, calcareous areas, gravel, scree, seeps, swales, riparian areas, stream banks, waterfalls, lake margins, ponds, shallow freshwater, sphagnum bogs, fens, heath, subalpine meadows, alpine, area dominated by moss or lichen, moist-wet meadows, upper beach meadows, maritime beaches.

The sensitive plants listed below are suspected to occur in the Project Area since the area contains appropriate habitats and is within the known or suspected range of the plants:.

Arnica lessingii ssp. *norbergii*

Norberg Arnica generally occurs in open forest, heath, dry and wet meadows, and alpine and subalpine habitats. According to Hulten (1968), it may be only a local variation of *Arnica lessingii*. It is known from several widely scattered locations across southeastern, southwestern, and southcentral Alaska.

Carex lenticularis var. *dolia*

Goose-grass sedge generally occurs in lake margins, marshy areas, heath, wet meadows, and alpine and subalpine habitats. It is known from several collections in southeast and southcentral Alaska and the Aleutian Islands. It is a Fish and Wildlife Service Species of Concern.

Dodecatheon pulchellum ssp. *alaskanum*

Pretty shooting star generally occurs in upper beach meadows, wet meadows, and alpine and subalpine habitats. Six collections have been verified statewide, limited to southcentral and southeast Alaska. The taxon is a coastal polyploid race according to Hitchcock et al. (1955), and is difficult to distinguish from *Dodecatheon pulchellum* ssp. *superbum*. The taxonomic validity of the plant is questioned.

Draba borealis var. *maxima*

Northern rockcress generally occurs in alpine tundra, heath, open woods, and rock outcrops. Nine

collections are known for the state, where it is limited to Kodiak, southcentral, and northern southeast Alaska.

Draba kamtschatica

Kamchatka rockcress generally occurs in alpine and subalpine habitats. Four occurrences are documented in Alaska, where the plant is apparently limited to southcentral and southeast Alaska, the Seward Peninsula and the Aleutians.

Glyceria leptostachya

Davy mannagrass generally occurs in streamsides, riverbanks, lake margins, marshy areas, and shallow freshwater. Two occurrences are documented for the state, where the plant is apparently limited to central and southern southeast Alaska.

Hymenophyllum wrightii

Wright filmy fern generally occurs in forest and forest edge habitats, particularly on tree trunks and rocks in humid, damp woods. Three occurrences are documented for Alaska, all in southeast, and all as gametophytes.

Isoetes truncata

Truncate quillwort generally occurs in shallow freshwater. State known occurrences are limited to southeast and southcentral Alaska. The plant's identity to the species level can only be confirmed in October, when the megaspores necessary for identification are mature.

Ligusticum calderi

Calder lovage generally occurs in forest edge, subalpine and alpine habitats, and on rock outcrops. The three documented Alaska occurrences are limited to southcentral and southeast Alaska.

Platanthera chorisiana

Choris bog orchid generally occurs in muskegs and heaths. Several occurrences are known for the state, in the Aleutians and southern coastal Alaska. Several additional populations were found during the 1995 and 1996 field seasons. This plant may be removed from the sensitive plant list in the future, as it appears to be more common than previously thought.

Platanthera gracilis

Slender bog orchid generally occurs in upper beach meadows, muskeg, heath, and wet meadows. Taxonomy of this plant is questioned, as some authors have subsumed the plant into *Platanthera saccata*. Four occurrences are known for the state, in southernmost southeast Alaska.

Poa laxiflora

Loose-flowered bluegrass generally occurs in upper beach meadows, open forest, and wet meadows. There are several occurrences in the state, limited to southeast Alaska.

Puccinellia kamtschatica

Kamchatka alkali grass generally occurs in maritime beaches and upper beach meadows. The taxonomy of the plant is questioned, as some authorities do not recognize this species as distinct from *Puccinellia nutkaensis*. Four occurrences are documented for the state, where the plant is apparently limited to southcentral and southeast Alaska, the Alaska Peninsula, and the Aleutian Islands.

Romanzoffia unalaschcensis

Unalaska mist-maid generally occurs in forest edges, streamsides, riverbanks, and rock outcrops. Several locations are known in the state, where the plant is apparently restricted to the eastern Aleutians, Alaska Peninsula, Kodiak and southeast Alaska.

Senecio moresbiensis

Queen Charlotte butterweed generally occurs in heath, dry and wet meadows, and alpine/subalpine habitats. Five occurrences are known for the state, limited to southern southeast Alaska.

Stellaria ruscifolia ssp. *aleutica*

Circumpolar starwort generally occurs in streamsides, riverbanks, alpine/subalpine habitats, and rock outcrops. Ten occurrences are known for the state, in southeastern, southcentral, and the Aleutians.

Botrychium ascendens

Ascending moonwort generally occurs in upper beach meadows, well drained open areas, and dry meadows. It is a relatively newly described taxon, previously collected from Yakutat and found there in 1996. While it is a Fish and Wildlife Service Species of Concern, it is not currently on the Region 10 Sensitive Species List, but is likely to be added in the future.

Salix reticulata ssp. *glabellcarpa*

Smooth-fruited netleaf willow generally occurs in alpine and subalpine areas. One population is known statewide, from Juneau. Other populations are limited to the Queen Charlotte Islands. It is not currently on the Region 10 Sensitive Species List, but is likely to be added in the future.

FIELD SURVEYS FOR SENSITIVE PLANTS

Since sensitive plants could potentially occur in the Project Area, and be affected by the proposed project (except the no action alternative), field surveys were conducted. Due to budget, personnel, and time restrictions, all areas proposed for action under any of the five action alternatives could not be surveyed.

In 1995, the Hoonah Ranger District Wildlife Biologist selected four areas for survey, based on vegetation and her experience in the area. No further information is available as to her selection method. In 1996, a risk model was used to stratify the Project Area so that surveys could be conducted in the habitats most likely to support sensitive plants. The following paragraphs describe the 1996 ranking methodology:

A tentative probability of sensitive plant occurrence was assigned using a risk model based on the common land unit (CLU) layer in the Chatham Area GIS. This CLU layer is derived from field work and aerial photograph review and assigns codes based on landform, geology, slope, soils, and vegetation to polygons across the Chatham Area. These polygons were correlated to the "preferred" habitat of sensitive plants, as developed from floras, plant collections, and experience by Forest Service ecologists and the Alaska Region Botanist (these habitats are listed above for each species). The correlation is not precise, and, in some cases, use of the correlation overestimates or underestimates the available habitat. Preferred habitats were mapped for each VCU, and the proposed timber harvest units and roads were overlaid. Details of this model are given in Appendix B.

Proposed timber harvest units intersecting preferred habitats were given a priority rating depending on overlap type and extent. Habitat boundaries are usually gradual rather than abrupt, which complicates delineation. Since the CLU polygons and the unit boundaries were drawn on different photograph sets, by different people, with differing pencil widths, typically there are "slivers" along unit boundaries. For example, the map may show an intersection of a proposed timber unit with muskeg. However, on the ground, the timber unit would not include the muskeg since it is not commercial forest land. Thus, discrepancies occur between the actual habitat boundaries and where they show on the map.

Units with these "slivers" along their boundaries were given a priority level of 1, as were units with no intersection with a preferred habitat. Lack of intersection with a preferred habitat **does not mean** sensitive plants could not occur in the unit, but that the occurrence is less likely.

Units with a larger intersection of preferred habitat were given a priority level of 2, 3, or 4, depending on the amount of intersection and the type of habitat intersected. Because more of the sensitive species "prefer" alpine/subalpine habitats, this category was given greater priority. Units with a significant intersection with alpine/subalpine habitats were given a priority level of 4. Those with a minor intersection with alpine/subalpine, or a significant intersection with a preferred habitat other than alpine/subalpine, were assigned priority level 3. Units with a minor intersection with a preferred habitat other than alpine/subalpine were assigned priority level 2. "Significant" and "minor" intersections were determined subjectively by the Forest Ecologist.

Proposed road segments were similarly assessed for survey priority, with priorities based on the amount and type of habitat crossed by the road corridor.

Subsequent to this analysis, aerial photographs were examined for each proposed unit and new road location. Priorities were confirmed or changed based on the photograph review. "Low probability habitat for sensitive plants" was assigned to units and road segments with zero or minor (e.g. sliver) overlap with preferred habitat. These were generally areas previously ranked "1", unless the photograph showed a significant overlap with preferred habitat that had not shown on the GIS maps. However, several areas initially ranked with a higher probability based on the CLU mapping were reassigned to this category when the photograph examination showed that the CLU-predicted habitat probably was not actually present (due to mapping errors, inaccuracy of the correlation, and slivering).

"Low" or "moderate" survey priority was assigned to units and road segments showing on the photographs to indeed have more than a minor overlap with a preferred habitat. Low survey priority was assigned to areas showing smaller overlaps with preferred habitats, particularly non-alpine areas, and appearing to have relatively homogenous vegetation. Moderate survey priority was assigned to areas with larger overlaps with preferred habitat, particularly alpine and muskeg. These were generally areas previously ranked 2 and 3. High survey priority was assigned to a few locations showing significant overlap with alpine areas and unusual vegetation or multiple vegetation types in a small area. These were generally areas previously ranked 4. Each of the low, moderate, and high survey priority areas was included in the pool for field surveys as time permitted.

Probability and priority rankings are shown on the Road and Unit Cards in the DEIS and are summarized in Table 3.

Many timber harvest units were found to lie primarily outside preferred habitats, which is not surprising since most of the Alaska Region sensitive plants prefer nonforest communities, and the timber units are placed in productive forest. Some units, however, and several proposed roads, however, cross preferred habitats.

The GIS maps used in the initial stratification are filed in the Project Planning Record. Aerial photographs and mylar overlays showing road and unit proposed locations are filed with the Planning Team.

Table 3. Proposed units and roads survey rankings

(All units/roads not listed are ranked as low probability habitat for sensitive plants)

Unit	Ranking*
1610	high survey priority
2220	low survey priority
2710	moderate survey priority
3020	moderate survey priority
3212	moderate survey priority
3222	moderate survey priority
3610	moderate survey priority
4440	low survey priority
4450	low survey priority
4910	moderate survey priority
5020	low survey priority
5080	low survey priority
5220	low survey priority
8000	high survey priority
20510	high survey priority
20710	high survey priority
20810	high survey priority
20910	low survey priority
61020	moderate survey priority
62510	moderate survey priority
63510	moderate survey priority
63520	moderate survey priority
64210	low survey priority
65020	moderate survey priority
Roads	
7508 road (near units 64010, 63940 etc.)	high survey priority (95; low 96)
7502 road (10-mile LTF)	high survey priority (95)
7500 road (top, near unit 62710, 62720)	high survey priority (95)
75007 road (to unit 61410 etc.)	high survey priority (95, 96)
750071 road (near 65010)	high survey priority
Temp road to unit 64410	moderate survey priority
Temp road to unit 2710 (dropped)	moderate survey priority
Temp road to unit 64210 (dropped)	low survey priority
Temp road to unit 63510	low survey priority

*1996 unless otherwise noted

Field surveys were scheduled to cover as many of the high, moderate, and low survey priority proposed roads and units as possible, within the constraints of budget, personnel, time available, safety, helicopter or other access, and proximity to other areas scheduled for a survey. Surveys were conducted in 1995 by Biological Technician Mary Dalton (with botanical experience), and two summer volunteers, trained for the purpose. Surveys were conducted in 1996 by Ecologist Michael Shephard (with botanical experience) and Regional Ecologist Greg Nowacki. Both crew leaders had completed sensitive plant training with the Regional Botanist.

Surveys were conducted 7/13 - 7/16, 1995 and 7/10 - 7/16, 1996. Surveys along proposed road corridors were generally of level 4 or 5 intensity (see Appendix C for survey intensity levels). Unit surveys were conducted at level 2 or 3 since usually only the portion of the unit falling in a preferred habitat was surveyed. Thus the survey intensity was greater for the preferred habitat (e.g., level 4 or 5), but is classified as a lower intensity for the unit as a whole.

During each survey, data were collected on species composition, site characteristics such as landform, elevation, aspect, slope, landscape position, plant community, and the type of sensitive species habitat surveyed. Data were collected along a survey route each time there was a major vegetation change, such as a change from forest to muskeg, or from western hemlock forest to mixed conifer forest. The survey protocol and a sample data sheet are shown in Appendix D. When sensitive plants were found, additional

data were collected, the plants usually photographed, and, if the population was large enough, a voucher specimen collected. This process follows the Region 10 Sensitive Plant Survey and Sighting guidelines prepared by the Regional Botanist. Sighting forms are forwarded to the Regional Botanist who sends the data on to the Alaska Natural Heritage Program.

Following each survey or survey group, a summary form (the Daily Sensitive Plant Survey Form) was completed, listing time spent on the survey, travel, and plant identification; distance surveyed; sensitive plants found; whether the survey was conducted at the appropriate time of year; and whether additional surveys were needed. The completion protocol and a sample form are shown in Appendix D. The daily plant survey forms, along with the field data sheets, are filed with the Forest Ecologist at the Chatham Area Supervisor's Office. Data were entered into EXCEL spreadsheet files; these files are archived with the Forest Ecologist. See Appendix E for copies of data.

The filmy fern, *Hymenophyllum wrightii*, was not given the same level of scrutiny as the other plants, because the gametophyte (the only known stage in Alaska) is minute. It is several millimeters long, one cell thick, 10-15 cells wide, similar in appearance to mosses, and therefore extremely difficult to find. Likely habitats were examined, but the fern could easily have been missed even if it did occur in the Project Area.

FIELD SURVEY RESULTS

Four surveys were conducted in 1995, and 12 in 1996, including areas in each of the VCUs proposed for action. One species of R10 sensitive plants was found in several locations: *Platanthera chorisiana*, choris bog orchid. Photographs were taken of the plant, and are filed with the Forest Ecologist. Voucher specimens were collected and are filed with the Regional Botanist.

Survey results are summarized in Table 4. Survey general data, site data, and vegetation data are shown in Appendix E. Survey routes are recorded on mylar overlays to aerial photographs, and are filed with the Forest Ecologist.

Table 4. Survey results for *Platanthera chorisiana* sightings

	Approx. population size	Status
Found outside proposed unit 2710	~2+	No action proposed for this area
Found within proposed units 62510	~15	Unit dropped from pool
63510	~10	Unit possibly can be modified to avoid (clearcut with reserves)
Found along proposed roads 75007	~100+ (95) ~45+ (96)	Road moved once to avoid 1995 site with 100+ (96 survey followed new, flagged route); probably cannot be moved further; therefore some orchids will be avoided and others not; indirect impacts (e.g. hydrologic change) may occur to populations near but not in road corridor
7508	~6	Possibly move initial bend in road higher and decrease impacts
Temp road to unit 64410	~10	Possibly can flag and avoid area

Platanthera chorisiana is currently on the R10 sensitive list and is proposed in the 1996 draft Tongass Land Management Plan to remain on the list. However, the Regional Botanist is considering removing this plant from the sensitive plant list (M. Stensvold, pers. comm. 9/96). *Platanthera chorisiana* is ranked G2G3 under the Natural Heritage Program ranking system, meaning the taxon is imperiled globally (G2) or the

taxon is either very rare and local throughout its range or found locally in a restricted range (G3). Surveys conducted in 1995 found this orchid at two additional locations on the Chatham Area, and at several sites on the Ketchikan Area.

The proposed 10-mile LTF site was surveyed in 1995. One clump of *Puccinellia* species, alkali grass, was found at the proposed site. A specimen was collected for verification. It is unlikely to be *P. kamschatica*, according to Regional Botanist Mary Stensvold (pers. comm. 7/95). *P. kamschatica* is a questionable taxon, and is not proposed to remain on the sensitive plant list in the 1996 draft Tongass Land Management Plan.

The surveys took place at the appropriate time of year to identify sensitive plants. No sensitive plants were found in stages which could not be identified.

DETERMINATION OF EFFECTS

Since not all areas were surveyed, habitat disturbance potential is high, and sensitive plants were found, a risk assessment is warranted (FSM 2672.43). This assessment considers risks to the known populations of *Platanthera chorisiana* as well as risks to other sensitive plants that may occur in the Project Area, since surveys could not cover the entire area.

Determination of risks to populations of sensitive plants takes into account: size, density, vigor, habitat requirements, location of the populations, and consequences of adverse effects on the taxa as a whole within their range and within the National Forest.

Direct Effects

Aspects of this project that may have negative effects on sensitive plants or their habitat under the action alternatives are:

- destruction of plants and loss of habitat in road corridors due to trampling by workers, machinery, and deposition of road materials;
- destruction of plants in timber harvest units due to trampling by workers, trees falling on the plants, trees dragged/raised over the plants as the trunks are moved off-site, or slash deposited on the plants;
- death of plants growing on trees that are harvested;
- loss of habitat and death of plants growing in shallow freshwater (such as muskeg ponds) filled in by road construction;
- loss of habitat and destruction of plants growing in LTF sites due to trampling by workers and machinery, deposition of road materials or timber, washing up of "escaped" logs onto beach habitats;
- destruction of plants growing in areas used as helicopter access points to timber units, due to trampling by workers or helicopter landings.

These impacts are common to the five action alternatives, but the extent would vary by alternative. Alternative F would have the greatest impact on habitats since the proposed timber harvest acreage and extent of new road construction and road reconstruction are the largest under this alternative. The no action alternative (A) would not affect sensitive plants or their habitats.

Indirect Effects

Previously unknown populations of sensitive plants adjacent to and in the vicinity of the Project Area could be affected by implementation of any of the action alternatives. For example, sensitive plants could be indirectly, but adversely, affected by activities resulting in changes in hydrology, such as changes due to road building. Roaded and harvested areas may be more prone to soil erosion and landslides, depending

on site conditions, which could destroy sensitive plants or habitat.

Activities may indirectly affect sensitive plant populations and habitat through the introduction of exotic plants, which compete with native plants for available habitats.

Proposed activities may also affect sensitive plant populations by opening the canopy of previously forested areas, which frequently results in plant composition changes, and changes the amount of available habitat for forest species such as *Hymenophyllum wrightii*.

Deer populations may decrease under the action alternatives, which could reduce foraging on sensitive plants.

The action alternatives (B-F) would provide more roads into the area, probably increasing recreation (e.g., off-road vehicle use) and hunting use of the area, which may affect sensitive plants through trampling or changes in plant composition and hydrology. For example, ATVs ridden across muskegs often destroy the vegetation and soil structure, resulting in a mucky ditch replacing plant habitat.

Cumulative Effects

Effects on plant populations are cumulative over time, thus possible effects of the five action alternatives are cumulative with historical, present, and future uses of the Project Area. Previously constructed roads and clear cuts have increased the acreage of red alder, Sitka alder, willow, and black cottonwood in the Project Area, while previously harvested areas have decreased the acreage of late seral forest and increased the acreage of second growth. For the most part, cyclical changes in forest habitat from late seral to young second growth with harvest of timber do not affect sensitive species since the Alaska Region sensitive plants mainly prefer nonforest habitats. It is likely, however, that past road construction has degraded potential sensitive plant habitat.

Since the 1940s, the Project Area is estimated to have emerged, relative to sea level, between approximately 1.0 and 1.3 cm/yr (Hicks and Shofnos, 1965). This emergence is mainly due to isostatic rebound following the retreat of glaciers. Land emergence changes habitat availability. For example, as the land rises relative to sea level, new areas become available for colonization by beach plants. Former beaches are gradually colonized by upland plant species and may develop into forest. Over a longer time scale, the Project Area is located on a geologic block estimated to have been uplifted vertically 2 to 6 km since about 25 million years ago (Brew, 1988).

Island biogeographic principles have also affected plant composition in the Project Area: following glacial retreat, Chichagof Island had to be recolonized by plants from glacial refugia, either land masses not glaciated, or nunataks, peaks remaining ice-free while surrounded by icefields (Heusser, 1954; Pielou, 1991). The rate of recolonization will vary with distance from the refugium, so it is likely that plant distribution varies between the islands of southeast Alaska. Information on plant species distribution among the islands is lacking, but animal data show that there are differences among the islands. For example, brown bears occur on Admiralty, Baranof, and Chichagof Islands, but not currently on Prince of Wales Island.

Avalanches in the Project Area also affect plant habitats, by periodically setting back succession and often resulting in permanent shrubfields in the higher elevations.

Human uses can also impact sensitive plants, but since none of the Alaska Region sensitive plants are primary food or medicinal species, subsistence use is unlikely to affect populations significantly.

Plant succession is ongoing in the Project Area, and may convert forest to muskeg, landslide areas to shrublands, etc. All these community changes affect the availability of habitats for sensitive plants.

The proposed actions may exacerbate or ameliorate ongoing changes in the Project Area. Continued uplift may lead to new beach areas, while beach areas are damaged with development of LTFs. Sensitive species are uncommon and thus typically slower to invade new habitats.

Other cumulative effects in the Project Area are due to road construction, associated rockpits, debris, herbicide use, seeding with exotics, glacial advance or retreat and past logging. Future logging in the area, reconstruction of roads, and related activities will also affect sensitive plant habitats in the Project Area.

Mitigation Measures in the Alternatives

The order of priority for mitigation is: 1) avoid the impact, 2) minimize the impact, 3) rectify the impact, 4) reduce or eliminate the impact over time, and 5) compensate for the impact (FSM 1909.15 and 40 CFR 1508.20).

Mitigation measures to be included in the five action alternatives are recommended by each resource specialist, and include such measures as following best management practices (BMPs) for soil and water conservation, providing riparian conservation areas along certain streams, and following forest-wide standards and guidelines. Following the BMPs will reduce likelihood of soil erosion, which will mitigate possible loss of plant habitats. Riparian buffers will protect sensitive plants that may occur in riparian areas. Wildlife habitat mitigation includes avoidance of activities in beach and estuary fringes, which also protects the sensitive plants that prefer these habitats (e.g., *Puccinellia*, *Dodecatheon*, *Botrychium*).

Specific mitigation recommendations for different resources such as timber, soils, wildlife, are listed on the road and unit cards in the DEIS. Sensitive plant mitigation recommendations include the following:

- 1) Concentrate the timber harvest in unit 63510 away from the swales where *Platanthera chorisiana* is found (if need be, have a botanist/plant ecologist present during layout of this unit);
- 2) Drop unit 62510 from the unit pool this entry;
- 3) A botanist/plant ecologist shall flag the *Platanthera chorisiana* population(s) near the temporary road to unit 64410; state in the road contract that this flagged area is to be avoided;
- 4) A botanist/plant ecologist shall flag the *Platanthera chorisiana* populations near roads 75007 and 7508, and shall be present during the final field location/marketing of these road corridors; the locations shall be moved as much as is feasible to avoid known orchid populations;
- 5) A botanist/plant ecologist shall be present during or prior to unit layout in a few selected areas to further survey for sensitive plants;
- 6) Collecting plants and plant parts shall not be allowed except by permit issued by the Forest Supervisor for scientific or educational purposes;
- 7) No herbicide shall be applied within 100 feet of any known sensitive plant. If herbicides are needed, buffers will be clearly marked before treatment so applicators can easily see and avoid the sensitive plants;
- 8) Plants native to southeast Alaska will be used for any revegetation or restoration work in the Project Area.

Risk Assessment for Sensitive Plants

If a sensitive plant has been determined to be within the Project Area or within an area influenced by the project, then a risk assessment (analysis of impacts of the project on the species) is indicated. A risk assessment considers two factors: Factor 1) the consequence of adverse (or beneficial) effects on the

population, and Factor 2) the likelihood or probability that these effects will occur. Levels of consequence and levels of likelihood are described in Appendix F under the heading "Criteria for Risk Assessment." Sensitive plants were found, and a complete survey was not possible, so a risk assessment was prepared for the Project Area.

The direct, indirect and cumulative effects of the proposed project are used to determine the level of consequence and level of likelihood. After both of the factors have been determined, the preparer analyzes the significance of the effects of the proposed project on the sensitive plant. This process documents the rationale for arriving at the determination of effect (according to WO letter dated May 12, 1992).

The impacts of timber harvest, road building, and LTF construction are different, so these activities are analyzed separately.

Timber Harvest

The **consequences of adverse impacts** to sensitive plants due to timber harvest are **high** because timber harvest results in significant habitat disturbance through tree falling, removal, dragging, and slash piling. Sensitive plants most likely to be affected by timber harvest are *Arnica lessingii* ssp. *norbergii*, *Draba borealis* var. *maxima*, *Hymenophyllum wrightii* and *Poa laxiflora*.

The **likelihood of adverse effects** is **high** for *Platanthera chorisiana* because these sensitive plants were found in two of the proposed units surveyed in the Project Area. The **likelihood of adverse effects** is **low** for other sensitive taxa because: 1) no other taxa were found in surveys; 2) there are no previously known populations of sensitive plants in the Project Area; 3) most of the Sitka and Hoonah Districts sensitive plants do not occur in the forest habitat proposed for harvest; and 4) no long-term change in habitat type is expected. By alternative, the timber harvest impacts are as shown in Table 5. Alternative F would impact the greatest total acreage, which is likely to include the greatest acreage of sensitive plant habitat.

Table 5. Timber harvest impacts by alternative (Sources for acres, mmbf, area: Sherrod 1996, Nelson 1996)
Note that less than the total proposed harvest acreage is sensitive plant preferred habitats.

Alternative	Proposed harvest acres	Proposed output mmbf	% Project Area*
A	0	0	0
B	2,038	25.1	5.7%
C	2,028	30.9	5.7%
D	1,748	25.9	4.9%
E	1,662	25.8	4.7%
F	2,517	39.8	7.0%

* Total Forest Service land in the Project Area including LUD III special, encumbered lands, and partial interest lands but excluding private lands is 35,723 acres. Obviously, much less than this amount is harvestable; the percentages are given for comparison purposes only.

Road Construction

The **consequences of adverse impacts** to sensitive plants due to road construction are **high** because habitats and populations in road corridors are destroyed. Some proposed roads are intended as temporary roads, but the change in habitat is often permanent. The sensitive plants most likely to be affected by road construction are: *Arnica lessingii* ssp. *norbergii*, *Carex lenticularis* var. *dolia*, *Dodecatheon pulchellum* ssp. *alaskanum*, *Draba borealis* var. *maxima*, *Hymenophyllum wrightii*, *Ligusticum calderi*, *Platanthera chorisiana*, *Platanthera gracilis*, *Poa laxiflora*, *Romanzoffia unalaschcensis*, and *Senecio moresbiensis*.

The **likelihood of adverse effects** is **high** for *Platanthera chorisiana* because these sensitive plants were found in several road corridors. The **likelihood of adverse effects** is **low** for other sensitive taxa because: 1) no other sensitive plants were found in the preferred habitats surveyed in the project area; 2) there are no previously known populations of sensitive plants in the Project Area; and 3) the total acreage of the Project Area that will be converted to roads is low. By alternative, the road construction impacts are as

shown in Table 6. Alternative F would impact the greatest total mileage, which is likely to include the greatest amount of sensitive plant habitat.

Table 6. Road construction impacts by alternative (Sources for mileage, area: Sherrod 1996, Nelson 1996)
Note that less than the total proposed road acreage crosses sensitive plant preferred habitats.

Alternative	New road miles/acres*	Reconstructed road** miles/acres	% Project Area#
A	0	0	0
B	7.8/47	21.6/131	0.50%
C	9.5/58	21.7/132	0.53%
D	9.2/56	10.7/65	0.34%
E	8.4/51	21.6/131	0.51%
F	9.7/59	22.1/134	0.54%

*Minimum clearing for the standard 14-foot road is 44-46 feet; a 50-foot width was used as an average clearing size to calculate the extent of disturbance

**Much of this acreage has already been impacted and is unlikely to be sensitive plant habitat

#Total Forest Service land in the Project Area including LUD III special, encumbered lands, and partial interest lands but excluding private lands is 35,723 acres.

LTFs

New LTFs are proposed at 10-mile and Sunny Cove Too, as is reconstruction of the existing Sunny Cove LTF under the various alternatives. The **consequences of adverse impacts** to sensitive plants due to LTF construction are **high** because habitats and populations in LTF sites are destroyed. Although the sites are only used on short-term bases for log transfer, they are likely to be reactivated for future harvest, and used as recreational access points so that ground disturbance continues after the proposed log transfer is complete. The sensitive plants most likely to be affected by LTF construction are: *Dodecatheon pulchellum* ssp. *alaskanum*, *Platanthera chorisiana*, *Platanthera gracilis*, *Poa laxiflora*, *Puccinellia kamtschatica*, and *Botrychium ascendens*.

The **likelihood of adverse effects** is **low** for *Platanthera chorisiana* and other sensitive taxa because 1) no sensitive plants were found at the 10-mile LTF site; 2) there are no previously known populations of sensitive plants in the Project Area; and 3) the total acreage of the project area that will be converted to LTFs is low. A maximum of two new transfer sites is proposed. The existing LTF at Sunny Cove may be reconstructed, but this should not involve any decrease in sensitive plant habitat over the existing impacted area. The Sunny Too site was not surveyed since it was added as a possibility after surveys were scheduled. By alternative, the LTF impacts are as shown in Table 7. Alternative B would have the greatest impact since it has a new LTF and the reconstruction.

Table 7. LTF impacts by alternative (Source: Sherrod 1996)

Alternative	LTFs proposed
A	none
B	Sunny Cove, 10-mile
C	Sunny Too
D	10-mile
E	Sunny Cove
F	Sunny Too

For *Platanthera chorisiana*, known effects by alternatives range as shown in Table 5. Alternatives C, D, E, and F would have comparable negative effects on the known populations. Alternative F would likely have the greatest negative effect on any unknown populations since it impacts more acres than the other alternatives.

Table 5. Negative and positive known effects on *Platanthera chorisiana* from proposed actions

Effects	Alternatives including effect
Negative	
Temporary road to unit 64410 may impact known population directly if road cannot avoid the plants, or indirectly from road effects	B, C, D, E, F
Known plants in unit 63510 likely to be impacted although may be placed in reserve areas (harvest calls for clearcut with reserves)	C, D, E, F
Known plants on proposed road 75007 likely to be impacted directly and indirectly although some of population will be protected by road location change	B, C, D, E, F
Known plants on proposed road 7508 to unit 64010 likely to be impacted although may be free of direct impacts if road can be moved slightly	C, D, E, F
Positive	
Protection of known population in unit 62510 since unit dropped	A, B, C, D, E, F
Protection of all known and unknown populations	A (no action)
Protection of known plants outside unit 2710 since road dropped (helicopter unit)	A, B, C, D, E, F

The overall risk to *Platanthera chorisiana* due to project activities is **high** because known populations will be impacted indirectly, if not directly, by project implementation. However, other known *Platanthera chorisiana* populations will be protected in parts of the Project Area, so that a viable population is likely to remain in the Project Area. As noted earlier, this sensitive plant is thought to be more common than previously estimated, according to Mary Stensvold, Regional Botanist, and populations are also known from outside the Project Area.

The overall risk to sensitive plants other than *Platanthera chorisiana* due to project activities is **moderate** because it is unlikely that significant populations of sensitive plants occur in the areas proposed for activities, but if they do occur, impacts would be high on those populations.

The ratings for the risk assessment are defined in Appendix F.

Determinations

Based on the rationale described above, the alternative courses of action (including the listed mitigation measures) will result in the following impacts on sensitive plants. Determinations are listed by activity type and separately for the sensitive species known to occur in the Project Area and for the other sensitive plants which might occur. Determinations are per May 15, 1992 letter of direction from WO.

For *Platanthera chorisiana*, **timber harvest** under any of the five action alternatives may impact individuals but is not likely to cause a trend to federal listing or loss of viability.

For the other sensitive plants which could occur in the Project Area, **timber harvest** under any of the five action alternatives may impact individuals but is not likely to cause a trend to federal listing or loss of viability.

For *Platanthera chorisiana*, **road construction/reconstruction** under any of the five action alternatives may impact individuals but is not likely to cause a trend to federal listing or loss of viability.

For the other sensitive plants which could occur in the Project Area, **road construction/reconstruction** under any of the five action alternatives may impact individuals but is not likely to cause a trend to federal listing or loss of viability.

For *Platanthera chorisiana*, **LTF construction /reconstruction** under any of the five action alternatives may impact individuals but is not likely to cause a trend to federal listing or loss of viability.

For the other sensitive plants which could occur in the Project Area, **LTF construction /reconstruction** under any of the five action alternatives **may impact individuals but is not likely to cause a trend to federal listing or loss of viability.**

The no action alternative would have no impact on *Platanthera chorisiana* or any of the other sensitive plants which could occur in the Project Area.

Additional Management Recommendations

IF ANY PREVIOUSLY UNDISCOVERED SENSITIVE PLANTS OR PROPOSED SENSITIVES ARE ENCOUNTERED AT ANY POINT IN TIME PRIOR TO OR DURING IMPLEMENTATION OF THIS PROJECT, WORK WILL BE HALTED UNTIL THE REGIONAL BOTANIST AND/OR FOREST ECOLOGIST IS CONSULTED AND NECESSARY MITIGATION MEASURES ARE ENACTED.

MONITORING

Monitoring of the known populations and additional surveys for *Platanthera chorisiana* should occur in the project area, to determine extent, health and stability of populations, and habitat requirements.

Known populations of the orchids shall be mapped on confidential aerial photographs and/or topographic maps which are not available for public scrutiny. (Locations shall be kept confidential until more is known about the populations, their distribution and habitat requirements.) Annual stem counts of these populations shall occur in mid-late July. Hoonah or Sitka Ranger District Biologists or Biological Technicians can conduct these counts with training from the Regional Botanist or Forest Ecologist. Dominant plant species in the orchid habitat shall be recorded with their percent cover on a 2 by 2 m quadrat, centered over at least one main orchid cluster in each population. Population vigor shall also be recorded (qualitative observations), along with observations on any disturbance that may have occurred to the area. Monitoring results will be reported to the Regional Botanist who will determine appropriate responses to any significant population change (increase or decrease). Monitoring plans may be updated in the future depending on stability of populations; e.g., stem counts may be decreased to a biannual frequency. Population photographs may also be taken as part of monitoring.

No collection of orchids shall occur as part of the monitoring, unless requested by the Regional Botanist.

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Appendix A:

SENSITIVE SPECIES LIST
VASCULAR PLANTS
ALASKA REGION

1. Crucifer, no common name (*Aphragmus eschscholtzianus*)
2. Norberg arnica (*Arnica lessingii* ssp. *norbergii*)
3. Goose-grass sedge (*Carex lenticularis* var. *dolia*)*
4. Edible thistle (*Cirsium edule*)
5. Pretty shooting star (*Dodecatheon pulchellum* ssp. *alaskanum*)
6. Northern rockcress (*Draba borealis* var. *maxima*)
7. Kamchatka rockcress (*Draba kamtschatica*)
8. Tundra whitlow-grass (*Draba kananaskis*)
9. Davy mannagrass (*Glyceria leptostachya*)
10. Wright filmy fern (*Hymenophyllum wrightii*)
11. Truncate quillwort (*Isoetes truncata*)
12. Calder lovage (*Ligusticum calderi*)
13. Pale poppy (*Papaver alboroseum*)
14. Choris bog orchid (*Platanthera chorisiana*)
15. Bog orchid (*Platanthera gracilis*)
16. Loose-flowered bluegrass (*Poa laxiflora*)
17. Smooth alkali grass (*Puccinellia glabra*)
18. Kamchatka alkali grass (*Puccinellia kamtschatica*)
19. Straight-beak buttercup (*Ranunculus orthorhynchus* var. *alaschensis*)
20. Unalaska mist-maid (*Romanzoffia unalaschcensis*)
21. Queen Charlotte butterweed (*Senecio moresbiensis*)
22. Circumpolar starwort (*Stellaria ruscifolia* ssp. *aleutica*)

May be added to list in future:

23. Smooth-fruited netleaf willow (*Salix reticulata* ssp. *glabellcarpa*)
24. Ascending moonwort (*Botrychium ascendens*)*

*Also USFWS Species of Concern

Appendix C

Enhancement Opportunities Mitigation, and Monitoring

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Appendix C

Enhancement Opportunities and Mitigation Measures

Enhancement Opportunities

Silviculture

Silviculture enhancement opportunities include both post-harvest hand planting and post-harvest precommercial thinning. In addition there are silviculture opportunities in previously harvested units. Further field work is needed to identify specific timber stands where post-harvest silviculture treatment is most appropriate. In general, many of these stands are in riparian areas and silviculture treatments would benefit other resources besides timber production, including wildlife, fisheries, soils, and watershed.

Silviculture treatments that may benefit wildlife include: mixed grid spacings, thickets, and gaps. These treatments could enhance forage production, hiding cover, and thermal cover requirements for wildlife. Silviculture treatments that are in areas adjacent to streams may increase diversity, maintain/enhance wildlife travel corridors, and enhance tree growth to accelerate production of large trees to provide future large woody debris input into streams.

Silviculture treatments are expected to occur in the Indian River Project Area after timber harvest activities are completed. These treatments include hand planting, precommercial thinning of proposed harvest units, and surveys of possible precommercial thinning of previously harvested areas.

Hand Planting

Hand planting of Sitka spruce and Alaska-cedar is proposed for units to be harvested using the clearcut with green tree retention harvest method, where a significant portion of the existing stand is composed of one of these species. This will maintain cedar as a component in the post-harvest stand, and will alleviate concerns over natural regeneration of yellowcedar following harvest. In addition, planting spruce and Alaska-cedar will improve structural and horizontal diversity in the post-harvest stand. Table C-1 shows units proposed for hand planting by alternative.

Table C-1
Units Proposed for Hand Planting

Alternative B	Units
146 Acres	2220, 2310, 2810, 2820, 62720, 63840, 63920
Alternative C	Units
209 Acres	2810, 2820, 3112, 60420, 62730, 62840, 63110, 63510, 63920, 63960, 63970, 63971, 65013
Alternative D	Units
114 Acres	60420, 62730, 62840, 63110, 63510, 63920, 63960, 63970, 63971, 65013
Alternative E	Units
156 Acres	2310, 2340, 3020, 62720, 62730, 62740, 62840, 62850, 63110, 63510, 63920, 63960, 63970, 63971, 65013
Alternative F	Units
281 Acres	2220, 2310, 2340, 2810, 2820, 3010, 3020, 3112, 60420, 62730, 62840, 63110, 63510, 63920, 63960, 63970, 63971, 65013

Source: USDA Forest Service SIS 1996

Appendix C

Precommercial Thinning

Precommercial thinning to control stocking and species composition, as well as to improve wildlife habitat, is projected for 39 acres of past harvest in VCU 2221 in all alternatives. Units harvested under this project would be surveyed for precommercial thinning needs between 15 and 20 years after harvest. Projections are based on units with a site index equal to or greater than 80, as these are the most productive sites and would be the highest priority for thinning. Additional units may be thinned, based on benefits to wildlife and/or availability of funding.

Silviculture Treatments in Previously Harvested Areas

Surveys for precommercial thinning needs are scheduled in the Project Area for areas which have previously been harvested. Table C-2 displays planned surveys, by VCU and calendar year for which survey is scheduled.

A large portion of the acres displayed above are anticipated to be thinned for wildlife benefits as well as timber production values. Many of these areas have high wildlife value and use; mixed grid spacings, thickets, and gaps will be created during thinning operations in these areas to enhance forage production, hiding cover, and thermal cover requirements for wildlife.

Additional acres located adjacent to these harvest areas may be considered for riparian thinning projects. Many of these occur in riparian areas, where past harvest often removed a portion or all of the large trees adjacent to the stream. Riparian thinning may be used in some cases to increase species diversity, maintain/enhance wildlife travel corridors, and enhance tree growth to accelerate production of large trees to provide future large woody debris input into the stream system.

Table C-2
Precommercial Thinning Surveys of Previously Harvested Units
Within the Project Area

VCU	Total Acres	Calendar Year Survey Scheduled
2160	35	1999
2160	546	2000
2160	10	2001
2220	345	1999

Source: USDA Forest Service SIS 1996

Fisheries, Watershed, and Road Management Improvement Opportunities

Inventory work has been completed in the Project Area. Several watershed improvement needs and enhancement opportunities have been identified.

In general, fisheries and watershed rehabilitation work includes:

- Riparian thinning in second growth stands along Class I and II streams,
- Road maintenance, including: drainage structure maintenance or replacement on existing roads near Class I and II streams, armoring on fill/cut slopes where runoff enters streams, replacement of culverts that are too small, and replacement of culverts which block fish access to Class I and II stream habitat.

One specific fisheries enhancement opportunity has been identified for all alternatives. The opportunity exists in Indian River to provide coho salmon passage over two waterfalls to upstream spawning and rearing habitat. Increasing coho salmon numbers will benefit commercial, sport, and subsistence fishers.

Recreation

Roads could be converted to trails after logging is completed. Maintenance Level I roads could be brushed and used as hiking and cross-country ski trails (See Appendix D - Road Management Objectives, for information on road maintenance levels proposed in each alternative).

Other recreation trail opportunities include: 1) re-establishing the trail from Tenakee Springs to the head of Tenakee Inlet and inland hot springs along with a hut-to-hut system to allow overnight camping. 2) Improving and designating an existing hunting trail off the 10-Mile road system accessing alpine in VCU 2220. 3) Constructing a loop trail for hiking and cross-country skiing in VCU 2200, 2210, and 2220 from Tenakee Springs. 4) Constructing a loop trail for hiking and cross-country skiing in VCU 2220. The trail would utilize portions of the existing Indian River road and a new trail over the ridge to Tenakee Springs. 5) Constructing a Forest Service cabin six to eight miles from saltwater near the Indian River road to provide overnight accommodations for hikers, skiers, and hunters.

Mitigation Measures

The application of mitigation measures begins during the planning phase of a project. Issues raised during scoping were used to identify the resource areas where mitigation would be needed. Standards, guidelines, and direction contained in the 1997 TLMP, the Alaska Regional Guide, and applicable Forest Service manuals and handbooks were applied in developing alternatives and designing harvest units and roads.

A brief summary of mitigation measures common to all alternatives follows. Specific mitigation measures, as applied to individual roads and units, are shown in the road and unit cards (Appendices I and J). These cards list design considerations and provide a mechanism for tracking the project implementation.

The Forest Service will identify mitigation measures adopted to reduce or eliminate adverse effects at the time the Record of Decision (ROD) is signed.

Water Quality and Fish Habitat

Measures which protect water quality and fish habitat include application of Best Management Practices (BMPs) as stated in the Soil and Water Conservation Handbook (USDA FSH 2509.22). This handbook provides standard operating procedures for all stream classes. In addition, the TTRA mandates a minimum 100-foot buffer on all Class I streams and on Class II streams that flow directly into Class I streams. The 100-foot stream buffer width mandated by TTRA is a minimum. The width of this buffer strip may be greater than 100 feet for reasons such as topography, riparian soils, a windfirm boundary, timber stand boundaries, logging systems requirements, and varying stream channel locations. In addition, Class III streams have been buffered as necessary to protect water quality and fish habitat. Refer to Appendix J (Unit Design Cards) for the unit-specific stream buffering which is being applied.

Wildlife

Mitigation measures that protect water quality, fish, and riparian habitat also protect wildlife habitat for species such as brown bear and furbearers. Effects on wildlife are also reduced by intentionally harvesting units away from important wildlife habitats (to the extent practicable). Beach and estuary fringe habitats were avoided, and travel corridors left (where practicable) to allow undisturbed movement of wildlife.

In addition, impacts to wildlife will be mitigated by closing roads to motorized vehicles, retaining snags where safe to do so, and scheduling harvest activities to reduce disturbance to bald eagle nesting and rearing activities. Impacts to brown bear from bear-people interactions will be mitigated by informing logging camp residents about brown bear behavior and bear management policies. Incinerators will be used in logging camps for garbage disposal to prevent bear-garbage problems. Old-growth Reserves have been identified to maintain biodiversity and viable populations.

Appendix C

Recommended mitigation for other wildlife species include:

- For active marbled murrelet nest, protect 600-foot circular habitat around nest site until nestling fledges.
- For occupied great blue heron nest site, protect with a 600-foot buffer of undisturbed habitat March 1 to July 31.
- For active northern goshawk nest site, follow standards and guidelines, protect with a 100-acres of undisturbed habitat and have seasonal restrictions.
- For other active raptor nest site(s), protect nest stand during nesting season.

Subsistence

Because most subsistence use involves harvesting fish and game, mitigation measures that protect or enhance fish and game resources will also protect and enhance subsistence activities. Other mitigation measures were built into each of the action alternatives by placing units and roads away from beach and estuary fringe habitats and away from salmon-bearing streams. Also, road management can be used to maintain traditional access methods or create additional use areas.

Recreation

Because many recreation activities which take place in the Project Area are related to the consumptive use of fish and wildlife, mitigation measures that protect fish and game resources will also protect private and commercial recreation uses.

In all action alternatives, the timber sale contractor would be required to maintain clear access to the East Tenakee Trail during sale operations. After harvesting has been completed, any damage to the trail would be corrected to Forest Service trail standards by the contractor. These provisions would be included in the timber sale(s) contract (Nelson, 1996).

Scenic Quality

Visual impacts of the proposed units were mitigated by maintaining screens of trees along brushfields, following natural land forms with openings, avoiding long horizontal lines, and maintaining key viewsheds. In some areas, units were omitted that might have been visible to small boat users. In areas where harvest would be visible from the main travel routes, alternative silviculture methods would be employed that harvest less than 50 percent of the volume in a unit. None of the action alternatives propose units or roads in the areas of high or exceptional visual quality.

Effects of timber harvest on views from anchorages and known recreational day-use areas would be reduced by leaving buffers of timber along beaches and inland lakes. Roads and rock borrow pits would be located to minimize visibility, where practicable, in scenic viewsheds.

The upland staging area and East Tenakee Trail would be screened by a buffer of shoreline trees as wide as practicable at the Sunny Cove LTF site.

Helicopter logging has also been recommended to eliminate the need for roads which otherwise could create a significant and long-lasting visual impact.

Heritage Resources

Impacts to heritage resources would be mitigated to the fullest extent possible, in consultation with the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation, federally recognized tribes, and in cooperation with local residents and native groups. (See the Heritage Resources section in Chapter 4 for detailed discussion of mitigation measures pertinent to Alternative F and the East Tenakee Trail.)

Marine Resources

Appropriate marine protection measures would be implemented for all action alternatives. Guidelines developed by the Alaska Terminal Transfer Facility (ATTF) Guidelines Technical Subcommittee describe the physical requirements that are necessary to construct and operate an LTF for the protection of marine resources. The guidelines include mitigation measures and BMPs that decrease environmental impacts from LTFs, log raft areas, and adjoining facilities. (See LTF-Siting, Construction, and Operation Guidelines in Appendix K.) Following is a sample of these measures:

- Select a practicable log entry system that best minimizes fill placement impacts.
- Fill structures at the LTF site should be designed and constructed to avoid introducing fine sediments and organic matter into the water.
- In-water construction and filling should be timed to reduce impacts to marine and anadromous fisheries resources.
- Disposal of solid wastes should follow 18 Alaska Administrative Code (AAC) 60, which requires that solid waste be properly disposed of at an approved disposal site.
- Threshold limits are imposed on bark accumulation levels as a condition of the tidelands permit.
- The speed at which log bundles enter the water when a low-angle ramp system is used should be the slowest practicable speed achievable.
- The log transfer system and sort yard equipment should be operated and maintained to minimize petroleum and lubricating products from entering marine waters.

Sunny Cove LTF Tidelands

Timber previously harvested in the Indian River, 10-Mile Creek, and Freshwater Creek drainages was hauled to an LTF site in Sunny Cove. The cove is located approximately three miles southeast of the City of Tenakee Springs. The LTF was last used in 1986.

A Memorandum of Understanding (MOU) was signed in November 1996, between the City of Tenakee Springs and the Forest Service. Tenakee Springs voters approved the MOU in January 1997. The MOU was necessary to address concerns of the citizens of Tenakee Springs with regard to Forest Service use and occupation of City-owned tidelands in Sunny Cove.

The MOU addresses use of tidelands at and adjacent to the former LTF site, and documents compensation to be paid to the City of Tenakee Springs for use or occupation of their tidelands. As long as the Forest Service (including its Timber Sale Purchasers, Contractors, and Assignees) complies with the terms of the MOU, Tenakee Springs shall not terminate the MOU prior to December 31, 2003.

The following mitigation measures requested by the City of Tenakee Springs are also addressed in the MOU:

- No logging camps are allowed within the city limits of Tenakee Springs.
- The East Tenakee Trail, within the road right-of-way, will be properly maintained and protected by the Forest Service against impacts that may render it impassable or difficult to use as a result of logging activities.
- Vehicles traveling within 0.25 miles of the LTF and East Tenakee Trail will be limited to a maximum speed of 10 miles per hour.
- Vehicles and other machinery operating near the LTF will be muffled so as to comply with applicable federal and state standards.
- Use of helicopters at the tidelands area will be limited to emergencies or other non-recurring situations, and they may not be used for timber delivery or routinely fueled on the site.
- Notice of blasting activities shall be posted in Tenakee Springs and guards will be utilized on the trail when blasting activities are conducted. Blasting shall only occur between the hours of 8:00 a.m. and 5:00 p.m.

Monitoring

Implementation Monitoring

Timber Unit Layout

Objective:	To minimize the effects of timber harvest on other natural resources.
Desired result:	Unit card design specifications allow timber harvest to “lay lightly” on the land.
Measurement:	Sale layout employees will follow guidance on the cards. Other resource specialists will assist in unit layouts as indicated on the unit cards. At least 20 percent of the units implemented each year will be sampled for compliance with unit card design (BMPs 13.3, 13.8).
Threshold:	Unit sample should be within 10 percent of the parameters stated on the unit card.
Corrective action:	If needed, determine why unit was not laid out as designed. Document changes if they benefit the environment; change unit layout to match the design if effects are within BMPs.
Responsible staff:	District sale layout employees.
Record of results:	As-laid-out unit cards.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Timber Unit Yarding

Objective:	To ensure yarding minimizes the potential risk of soil loss in units with high-hazard soils.
Desired result:	Use of log suspension and yarding away from V-notches to protect high-hazard soils from erosion.
Measurement:	Sale administrator will ensure log suspension occurs in designated units. Specialists may spot check up to 20 percent of the units with high hazard soils for compliance with BMPs (BMPs 13.2, 13.4, 13.5, 13.9, 13.12, and 13.15).
Threshold:	Exposure of more than 10 percent of the affected area to bare mineral soil.
Corrective action:	Stop implementation and resolve among sale administrator, soil scientist, and timber sale operator. If not resolvable at the field level, bring to District Ranger.
Responsible staff:	Soil Scientist and SRD sale administration employees.
Record of results:	Daily diaries of engineering representatives and sale administrators, and memos of soil scientist documenting field verification activities.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Road Location and Design

Objective:	To ensure that roads are located and designed as specified in the EIS and on the road cards.
Desired result:	Road survey and design standards capture the stated intent of the EIS, which is to minimize impacts to soil and water resources (BMPs 14.2, 14.5, 14.6, 14.10, 14.12, and 14.4). Post sale road management is implemented as specified in the EIS.
Measurement:	Engineering representatives and road designers will review roads during contract preparation, field design staking, and at the close of the timber sale. Final plan-in-hand review will ensure compliance with RMOs.
Threshold:	Less than 10 percent variation between plans and field location. No variation from specified road management.
Corrective action:	Correct designs as needed in the pre-implementation stages. During plan-in-hand review, implement changes specified in design if not in compliance. Implement specified road management.
Responsible staff:	Engineering staff, and District Ranger for final approval.
Record of results:	Road survey and designs, and memos noting plan-in-hand review.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Slope Stabilization

Objective:	To determine if road designs and construction have met the intent of the EIS to reduce risk, of mass failure.
Desired result:	Design roads that minimize the potential for road-related mass failures during and after timber harvest (BMPs 14.7, 14.8, 14.12, and 14.20).
Measurement:	Engineering representatives and road designers will review roads during contract operations, assisted by the soil scientist or geotechnical engineer as needed. Final plan-in-hand review will ensure compliance with road design standards. The survey of timber unit areas and roads five years following close of operations will be scheduled by soil scientist or geotechnical engineer.
Threshold:	Less than 10 percent variation between plans and implementation.
Corrective action:	Correct designs as needed in the pre-implementation stages. During plan-in-hand review, contractor implements changes specified in the design if not in compliance.
Responsible staff:	Engineering staff and soils staff, District Ranger for final approval.
Record of results:	Road survey and designs, and memos noting plan-in-hand review or findings of soil scientist.
Annual cost:	\$4,000.
Extra FTE needs:	0.2 FTE, a geotechnical engineer as needed.

Erosion Control Measures

Objective:	To minimize erosion and sedimentation in timber harvest and road construction and maintenance activities.
Desired result:	Road survey and design standards capture the stated intent of the EIS, which is to minimize the risk of soil erosion and sedimentation to streams (BMPs 13.13, 13.16, 13.17, 14.5, 14.11, 14.16, 14.17, 14.18, 14.20, 14.22, and 14.26).
Measurement:	Engineering representatives and road designers will review roads during and following contract operations, assisted by soil scientist as needed. Periodic survey following close of operations will be scheduled by the soil scientist.
Threshold:	Erosion control methods in place 90 percent of the time.
Corrective action:	Correct designs as needed in the pre-implementation stages. During sale operations, contractor will implement changes specified by design guidelines if not in compliance.
Responsible staff:	Engineering staff and soils staff (post-harvest).
Record of results:	Daily diaries of engineering representative; following sale operations, results recorded by soil scientist in follow-up reviews.
Annual cost:	\$3,000.
Extra FTE needs:	0.1 FTE.

LTFs Spill Control Measures

Objective:	To ensure that petroleum spills do not affect marine waters.
Desired result:	LTF design and implementation will prevent fuel spillage from entering nearby waters.
Measurement:	Routine observation by LTF operator for oil sheen as required by EPA 402 permit (BMPs 12.8, 12.16, and 14.4).
Threshold:	Evidence of oil sheen on surface of water.
Corrective action:	Suspend operations and remedy the situation.
Responsible staff:	Sale administrator and field engineer.
Record of results:	Daily diaries of field inspectors.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Appendix C

LTF Removal

Objective:	To minimize permanent effects of LTFs on the marine environment.
Desired result:	Apply mitigation measures by removing temporary LTF structures at completion of contract operations. (BMP 14.5. Other measures may be stipulated in LTF permits following Record of Decision.)
Measurement:	Enforcement of contract specifications or MOU agreements at completion of operations.
Threshold:	Removal of LTF is incomplete.
Corrective action:	Withhold release of performance bond until mitigations are in compliance with contract specifications.
Responsible staff:	Sale administrator and engineering representative.
Record of results:	Letter authorizing movement of sale operations.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Stream Buffers for the Tongass Timber Reform Act

Objective:	To ensure compliance with the TTRA.
Desired result:	Ensure that minimum 100-foot buffers are maintained to protect water quality and stream habitat for all Class I and Class II streams that flow directly into Class I streams near timber harvest units (BMPs 12.6, 12.7, and 13.15), and per Regional Forester's November 21, 1995 letter, stream buffer and classification.
Measurement:	Spot-check 20 percent of all units near anadromous fish streams for compliance with TTRA. Field verification prior to timber harvest.
Threshold:	Minimum 100-foot buffer.
Corrective action:	Postpone implementation until minimum buffer widths are verified.
Responsible staff:	Fisheries Specialist and District timber layout and sale administration employees.
Record of results:	Sale layout cards for units and daily diaries of sale administrators.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Stream Buffers for Streams Not Covered by the TTRA

Objective:	To ensure protection of water quality streams.
Desired result:	For all Class II and Class III streams, manage according to the AHMU handbook (FSH 2609.22) (BMPs 12.6, 12.7, and 13.15), and per Regional Forester's November 21, 1995 letter, stream buffer and classification.
Measurement:	Specialists will spot-check up to 20 percent of the units offered for sale each year. Where units cross these types of channels, log suspension is required in the timber sale classes and yarding occurs away from the V-notches to minimize soil disturbance.
Threshold:	Boundaries along Class II and Class III streams will stop where planned in 90 percent or more of the units checked.
Corrective action:	Stop implementation and resolve among sale administrator, timber sale operator, and timber layout employees. If not resolvable at the field level, bring to District Ranger.
Responsible staff:	Hydrology specialist and District timber layout and sale administration employees.
Record of results:	As-laid-out cards for units prepared by layout employees, or daily diaries of engineering representatives and sale administrators.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Eagle Nesting Habitat

Objective:	To ensure Forest Service maintains minimum 330-foot buffers around eagle nest locations or minimizes impacts on nest locations with approved variances.
Desired result:	Protect eagle nest locations.
Measurement:	During sale implementation activities, observe eagle activities in nests close to logging camps and major road crossings, especially where variances to 330-foot minimum buffers were negotiated.
Threshold:	Management activities encroach on 330-foot minimum buffers or on trees with approved variances, causing eagle nesting to cease.
Corrective action:	If it appears eagle nesting is disrupted because of management activities, consult with the U. S. Fish and Wildlife Service (USFWS) to resolve potential problem.
Responsible staff:	Sale administrator and wildlife specialist.
Record of results:	Daily diaries of sales administrators, and memos of wildlife specialists recording findings at nest sites.
Annual cost:	Ongoing activity for sale administration. Site visits by wildlife specialists would cost an estimated \$4,000 per year during active logging operations.
Extra FTE needs:	None.

Beach Fringe, Estuary Fringe, and Riparian Habitat

Objective:	Avoid extending harvest units into beach or estuary fringe habitat. Ensure that travel corridors are protected.
Desired result:	Avoid loss of wildlife habitat or other effects beyond the parameters of the preferred alternative.
Measurement:	Unit cards identify unit locations, noting if they are adjacent to protected travel corridors, estuaries, or beach fringes. If so noted, the units must not be enlarged in a manner that adversely affects these wildlife features. Twenty percent of units laid out each year will be spot-checked for conformance with unit card design guides.
Threshold:	More than 10 percent of the spot-checked units deviate from wildlife concerns stated on cards.
Corrective action:	If landing or boundary locations are not feasible, the layout employee will contract a wildlife specialist and resolve desired changes at the time of layout. If still unresolved, bring to the District Ranger.
Responsible staff:	District timber layout and sale administration employees.
Record of results:	As-laid-out unit cards, as part of the pre-sale files.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Heritage Resources

Objective:	To ensure cultural resources are protected.
Desired result:	Resolve conflicts between goal of protecting cultural resources and need for timber harvest, road construction, and LTF construction to conform to the National Historic Preservation Act as amended. Confirm that cultural resources are protected before operations begin.
Measurement:	Evaluate impacts on cultural resources discovered after the start of timber harvest, road building, or LTF construction.
Threshold:	Evidence of cultural materials discovered during operations.
Corrective action:	Cultural resources specialist will ensure known sites are protected prior to implementing any land-disturbing activities. In the event of future discoveries, suspend activities until mitigation and protection measures are designated jointly by cultural resources staff, State Historic Preservation Officer, the Advisory Council on Historic Preservation, and District Ranger.
Responsible staff:	Sale layout employees, engineering and road design employees, and field inspectors of timber sale operations. Cultural resource specialist is available for field inspection as needed.
Record of results:	Record new discoveries in daily diaries of field inspectors. Cultural resource specialist will develop and maintain appropriate records for new discoveries brought to his or her attention.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Effectiveness Monitoring

Timber Restocking

Objective:	To ensure restocking occurs within minimum time frames stated in the NFMA.
Desired result:	Adequately restocked timber stands.
Measurement:	Stocking surveys at the first, third, or fourth year.
Evaluation:	Determination that stocking is adequate. Corrective action (i.e., planting) if natural regeneration is inadequate.
Responsible staff:	District staff.
Record of results:	Annual restocking report (NFMA).
Annual cost:	Ongoing business; no additional funding needed.
Extra FTE needs:	None.

Site Utilization

Objective:	To ensure timber growth on high productive sites is managed future fiber production.
Desired result:	On high site index sites, thin stands aged 15 to 20 years.
Measurement:	Conduct surveys of stands aged 10 to 12 years to identify and plan future thinning activities.
Evaluation:	Assess and document survey findings. Prioritize and program the best stands for thinning when they are 15 to 20 years old.
Responsible staff:	District employees.
Record of results:	Annual report of overall thinning and precommercial thinning (Supervisor's Office).
Annual cost:	Ongoing business; no additional funding needed.
Extra FTE needs:	None.

Post-Sale Road Use

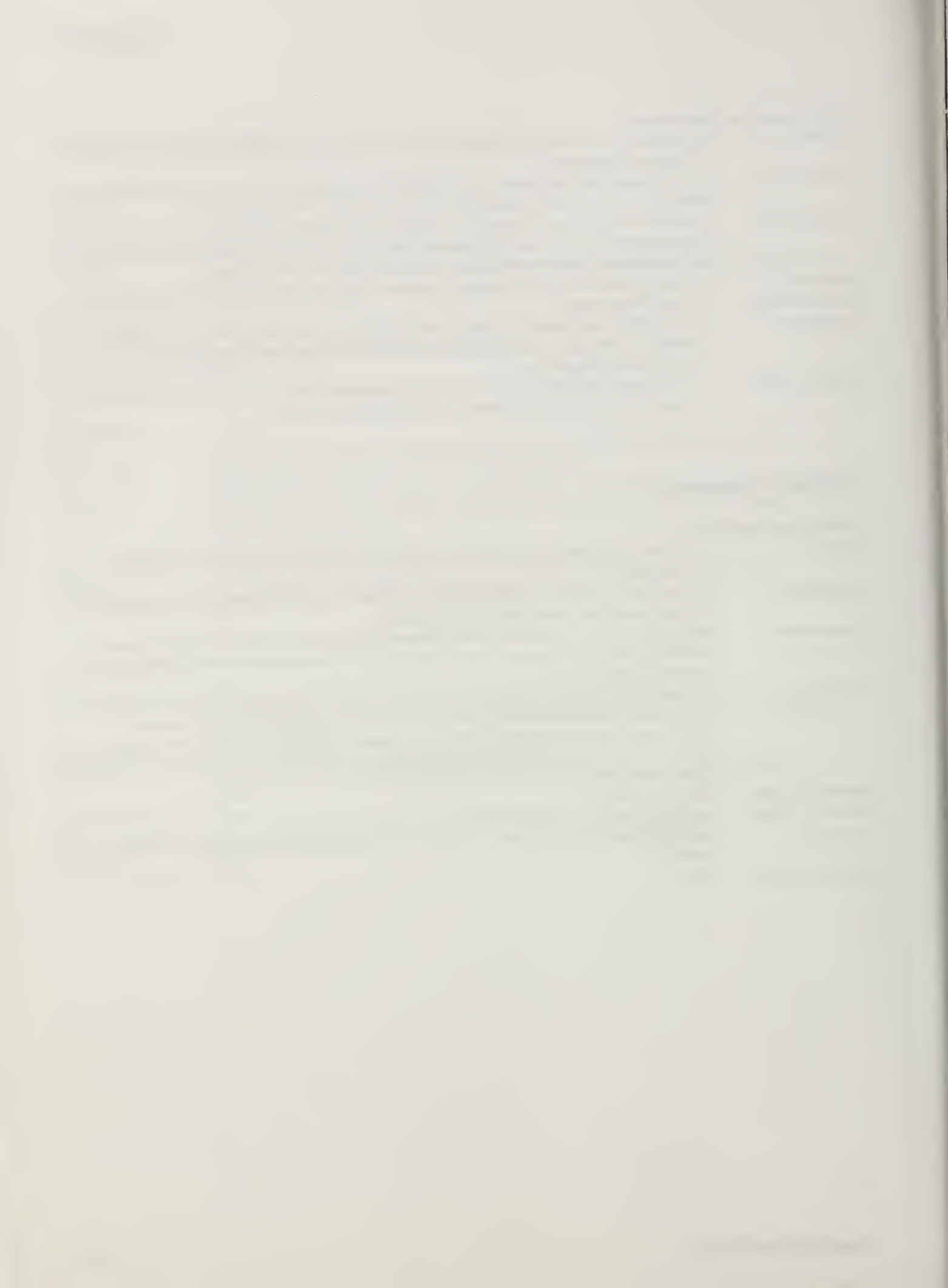
Objective:	To determine if RMOs for post-sale use are reflected by actual use.
Desired result:	Use of road systems after harvesting conforms to guidelines. Effects of road use on resources do not exceed stands.
Measurement:	Random visits to beach heads from May to November.
Evaluation:	Determine if use is occurring, if RMOs are being met, and if vehicles are honoring road closures.
Responsible staff:	District timber staff, with assistance from recreation specialist as needed.
Record of results:	Memo documenting findings of random visits (completed after each visit).
Annual cost:	\$2,500.
Extra FTE needs:	0.1 FTE.

Water Quality and Water Uses

Objective:	To ensure that management activities maintain water quality and protect beneficial water uses, particularly fish habitat.
Desired result:	To determine how well BMPs that are properly implemented protect water quality and water uses.
Measurements:	Field monitoring of road drainage structure and erosion, BMP effectiveness, LTFs, stream buffer strips for stability and effectiveness, Class III stream protection and yarding disturbance, and landslides as per annual Chatham Area BMP effectiveness monitoring.
Evaluation:	Assess and document survey findings. Determine mitigating actions if necessary or practical.
Responsible staff:	SO and District staffs.
Annual cost:	LTF, \$2,000; road drainage, \$3,000; buffer strip stabilization, \$500; Class III stream and yarding, \$1,000; BMP effectiveness, \$1,500; landslide, \$1,000; buffer strip effectiveness will be done outside Project Area.
Extra FTE needs:	LTF, 0.1 FTE; road drainage, 0.1 FTE; buffer strip stabilization, 0.1 FTE; Class III stream and yarding 0.1 FTE; BMP effectiveness, 0.1 FTE; landslide, 0.1 FTE.

Validation Monitoring**Uneven-aged Management**

Objective:	To determine the effectiveness and feasibility of uneven-aged management silvicultural prescriptions.
Desired result:	Residual trees are still standing and remain windfirm. Adequate regeneration is occurring in harvested openings. Slope stability is maintained.
Measurement:	Document the effect of opening the stand on the windfirmness of residual trees and on slope stability. Measure stocking and species composition of regeneration at third or fourth year, and at approximately year 10.
Evaluation:	Evaluate the effectiveness of group selection and single tree selection as viable silvicultural prescriptions. Determine whether stocking in groups and created openings is adequate. Prescribe planting if natural regeneration is inadequate. Determine whether uneven-aged systems are appropriate to meet the stated unit-specific objectives such as protection of unstable slopes, visual resources, wildlife and fish habitat, etc.
Responsible staff:	District Silviculture.
Record of results:	Memos documenting findings of visits.
Annual cost:	Ongoing business in conjunction with stocking and thinning surveys; no additional funding needed.
Extra FTE needs:	None.



Appendix D

Road Management Objectives (RMOs)

Appendix B

Continued from page 10

Road Management Objectives

Road Management Definitions and Terminology used in RMO Summary Tables

Road Status

- **E:** Existing road.
- **E(R):** Existing Road, scheduled for reconstruction.
- **P:** Proposed for construction.

Service Life (The length of time a facility is expected to provide a specified service.)

- **Long-term:** Service life of at least ten years.
- **Intermittent:** Operated for periodic service, and closed for more than one year between periods of use.

Service Level (Based on significant traffic characteristics and operating conditions for a road. Reflects factors such as speed, travel time, traffic interruptions, freedom to maneuver, safety, driver comfort, convenience, and operating costs.)

- **C:** Traffic flow is slowed by road condition. Traffic volumes are frequently controlled as the capacity is reached. Accommodates mixed traffic (all vehicle types). Meets minimum safety requirements. Alignment is generally dictated by topographic features. Travel efficiency is traded for lower construction costs. Road surface may not be stable under all traffic or weather conditions during the normal use season.
- **D:** Traffic flow is slow or may be blocked by an activity. Traffic volumes are intermittent and usually controlled; volume is limited to that associated with the single purpose (e.g., timber harvest). Not designed for mixed traffic. Need for safety protection is minimized by slow speeds and strict traffic controls. Alignment is dictated by topography. Road surface is rough and irregular.

Functional Classification (The way in which a road services land and resource management needs and the character of service it provides.)

- **A:** Arterial road. Provides service to large land areas and usually connects with other arterial roads or public highways. (Due to the remoteness of the Indian River Timber Sale(s) Project Area, and the fact that the road systems planned for the area are small and not interconnected, no roads are classified as arterials.)
- **C:** Collector road. Serves smaller land areas than an arterial road. Usually connects arterial roads to local roads or terminal facilities.
- **L:** Local road. Connects terminal facilities with other local, collector, or arterial roads, and public highways. Usually local roads are for a single purpose, such as timber harvest.

Post-harvest Maintenance Level (Defines the level of service provided by, and maintenance required for, a specific road after harvest.)

- **Level 1:** Normally assigned to intermittent service roads during the time they are closed to vehicular traffic. In the Indian River Timber Sale(s) RMO summary tables, this level also applies to short-term roads after the purpose for which they were constructed is completed. At this level, drainage structures are removed, the roadbed is waterbarred, and basic custodial maintenance is performed to keep damage to adjacent resources at an acceptable level and to perpetuate the road to facilitate future management activities.
- **Level 2:** Assigned to roads needed by high clearance vehicles between periods of harvest. Planned post-harvest vehicle traffic in the Indian River Timber Sale(s) Project Area is expected to be either high clearance vehicles (HCV) or all-terrain vehicles (ATV), to accomplish administrative and recreation access objectives. Roads will be logged out and brushed as necessary to provide passage for ATVs. The road prism will be maintained to provide for passage of high clearance vehicles. Barricades will be placed at the entrance of each road maintained at this level, for ATV access, to effectively block vehicles greater than 50" in width.

Post Harvest Access Needs and Traffic Strategies:

1) Future Commercial Timber Volume (Is there additional timber that this road access for which it will be needed in the future?)

- **Yes:** Additional timber exists for which this road will be needed in the future.
- **No:** No additional timber exists for which this road will be needed in the future.

2) Silviculture/Administration (Access needed to perform administration or post-sale silviculture practices, and method of access.)

- **HCV:** High clearance vehicle, pickup-type 4-wheel drive.
- **ATV:** All terrain vehicle, smaller 4-wheel or motorcycle.

3) Post-harvest Public/Recreation Traffic Strategies (Describes methods employed on forest development roads to control traffic. Used to prevent damage to the roadway, to abate unsafe traffic conditions, or to control use to meet other specific management direction such as protecting wildlife habitat or achieving semi-primitive recreation objectives.)

- **Encourage:** Encourage public use by means of appropriate signing, public notification, and active maintenance of the road prism.
- **Accept:** Public use is allowed but not encouraged, while road is maintained for administrative access.
- **Discourage:** Public access is discouraged by means of allowing alder growth at road entrance, non-removal of blowdown, or road prism deterioration within acceptable environmental limits. Road may also be signed to discourage use. Example: "Not Maintained for Public Traffic."
- **Eliminate:** Road is physically blocked to after sale traffic. Where prescribed for long-term intermittent roads, this strategy is achieved by means of placement of impassable barricades at road entrances. On short-term roads, removal of drainage structures effectively block traffic.
- **Prohibit:** Public access is prohibited by a road order (i.e., CFR closure). Implementation of this strategy on remote road systems such as the Indian River Timber Sale(s) Project Area may require the installation of gates, in addition to public notification and appropriate signing.

Post-harvest Resource Concerns (Specific road management concerns noted by resource specialists during planning process. See Road Cards in Appendix I, for mitigation measures related to concerns.)

- **Hydrology/Soils**
- **Wildlife**
- **Subsistence**
- **Fish and fish habitat**

Alternative C

[illegible]

Alternative E

Appendix E

Harvest Unit Detail Tables

Appendix 3

Appendix 3: List of references

**Indian River Timber Sale
Alternative B**

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
1511	5.3	Helicopter	Single Tree Selection	0.20	30
1520	10.9	Shovel	Group Selection	0.20	62
1610	14.2	Helicopter	Overstory Removal	0.50	96
2220	31.9	Helicopter	Clearcut w/Green Tree Retention	0.90	468
2310	9.7	Helicopter	Clearcut w/Green Tree Retention	0.90	144
2810	13.6	Cable	Clearcut w/Green Tree Retention	0.90	259
2820	58.4	Helicopter	Clearcut w/Green Tree Retention	0.90	1155
3010	13.1	Helicopter	Group Selection	0.20	45
3212	2.3	Helicopter	Patch Clearcut	0.35	15
3221	32.9	Cable	Clearcut w/Green Tree Retention	0.90	847
3222	46.9	Cable	Patch Clearcut	0.35	388
3520	30.8	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	552
3530	32.3	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	646
3610	25.7	Cable	Clearcut w/Green Tree Retention	0.90	504
4120	58.7	Helicopter	Clearcut w/Green Tree Retention	0.90	965
4420	38.2	Cable	Clearcut w/Green Tree Retention	0.90	994
4440	20.0	Helicopter	Patch Clearcut	0.35	143
5010	19.3	Helicopter	Overstory Removal	0.70	247
5011	17.5	Shovel	Overstory Removal	0.70	320
5020	29.7	Helicopter	Overstory Removal	0.70	275
5040	45.3	Helicopter	Clearcut w/Green Tree Retention	0.90	731
5080	23.8	Helicopter	Overstory Removal	0.80	316
5220	35.9	Helicopter	Group Selection	0.20	124
5840	2.7	Helicopter	Overstory Removal	0.70	53
20510	16.6	Helicopter	Clearcut w/Green Tree Retention	0.90	241
20610	13.7	Helicopter	Overstory Removal	0.80	190
20710	10.7	Cable	Single Tree Selection	0.50	43
20810	21.8	Helicopter	Overstory Removal	0.70	246
21010	16.1	Cable	Single Tree Selection	0.50	233
21310	11.0	Helicopter	Overstory Removal	0.50	159
21410	25.1	Cable	Patch Clearcut	0.20	145
21420	25.0	Helicopter	Group Selection	0.20	145
21511	17.6	Cable	Patch Clearcut	0.20	102
21520	23.5	Helicopter	Overstory Removal	0.50	340
21610	28.0	Helicopter	Single Tree Selection	0.40	309
21811	8.5	Helicopter	Group Selection	0.20	28
21820	51.9	Helicopter	Group Selection	0.20	206
21830	22.8	Helicopter	Clearcut w/Green Tree Retention	0.90	481
21840	43.4	Helicopter	Clearcut w/Green Tree Retention	0.90	1002
21910	11.7	Helicopter	Overstory Removal	0.50	105
22010	26.0	Helicopter	Overstory Removal	0.50	229
22110	14.2	Helicopter	Overstory Removal	0.50	129
22130	20.5	Helicopter	Clearcut w/Green Tree Retention	0.90	337
22140	57.5	Helicopter	Clearcut w/Green Tree Retention	0.90	944
61011	18.4	Helicopter	Group Selection	0.20	83
61012	9.7	Helicopter	Group Selection	0.20	36

**Indian River Timber Sale
Alternative B**

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
61020	26.3	Helicopter	Group Selection	0.20	98
61030	34.9	Helicopter	Overstory Removal	0.70	567
61310	11.8	Cable	Clearcut w/Green Tree Retention	0.90	153
61410	22.6	Cable	Clearcut w/Green Tree Retention	0.90	503
61510	29.6	Helicopter	Clearcut w/Green Tree Retention	0.90	693
62610	34.3	Helicopter	Group Selection	0.20	133
62611	19.9	Helicopter	Group Selection	0.20	144
62620	10.8	Helicopter	Group Selection	0.20	82
62630	15.3	Helicopter	Group Selection	0.20	116
62640	8.8	Helicopter	Group Selection	0.20	67
62650	44.8	Helicopter	Group Selection	0.20	182
62710	20.9	Cable	Clearcut w/Green Tree Retention	0.90	479
62720	9.2	Cable	Clearcut w/Green Tree Retention	0.90	152
62730	12.2	Helicopter	Group Selection	0.20	40
62740	11.0	Helicopter	Group Selection	0.20	39
62810	32.1	Helicopter	Group Selection	0.20	115
62820	14.2	Helicopter	Group Selection	0.20	52
62830	9.9	Helicopter	Group Selection	0.20	34
62840	5.5	Cable	Clearcut w/Green Tree Retention	0.90	90
62850	19.6	Helicopter	Group Selection	0.20	71
62860	13.7	Helicopter	Group Selection	0.20	50
63110	15.8	Helicopter	Group Selection	0.20	58
63120	9.4	Helicopter	Group Selection	0.20	34
63520	6.2	Cable	Patch Clearcut	0.20	27
63820	50.5	Helicopter	Group Selection	0.20	175
63840	28.2	Helicopter	Clearcut w/Green Tree Retention	0.90	732
63850	63.6	Helicopter	Clearcut w/Green Tree Retention	0.90	1456
63920	14.1	Helicopter	Clearcut w/Green Tree Retention	0.90	231
63940	9.2	Helicopter	Group Selection	0.20	28
63960	12.3	Helicopter	Group Selection	0.20	42
63970	12.7	Helicopter	Group Selection	0.20	57
63971	11.9	Helicopter	Group Selection	0.20	63
64010	12.4	Helicopter	Clearcut w/Green Tree Retention	0.90	195
64110	20.9	Helicopter	Clearcut w/Green Tree Retention	0.90	289
64210	28.3	Helicopter	Overstory Removal	0.80	390
64410	23.4	Cable	Clearcut w/Green Tree Retention	0.90	383
64420	9.4	Helicopter	Clearcut w/Green Tree Retention	0.90	155
64510	32.8	Helicopter	Overstory Removal	0.80	477
64530	3.4	Helicopter	Clearcut w/Green Tree Retention	0.90	50
Total	1,884.7			Total	23,814

**Indian River Timber Sale
Alternative C**

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
2810	13.6	Cable	Clearcut w/Green Tree Retention	0.90	259
2820	58.4	Helicopter	Clearcut w/Green Tree Retention	0.90	1155
3112	22.5	Cable	Clearcut w/Green Tree Retention	0.90	350
3221	32.9	Cable	Clearcut w/Green Tree Retention	0.90	847
3222	46.9	Cable	Patch Clearcut	0.35	388
3520	30.8	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	552
3530	32.3	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	646
3610	25.7	Cable	Clearcut w/Green Tree Retention	0.90	504
4011	5.4	Shovel	Single Tree Selection	0.20	39
4012	11.9	Helicopter	Single Tree Selection	0.20	69
4120	58.7	Helicopter	Clearcut w/Green Tree Retention	0.90	965
20510	16.6	Helicopter	Clearcut w/Green Tree Retention	0.90	241
20610	13.7	Helicopter	Overstory Removal	0.80	190
20710	10.7	Cable	Single Tree Selection	0.50	43
20810	21.8	Helicopter	Overstory Removal	0.70	246
20812	4.6	Helicopter	Overstory Removal	0.70	59
20910	8.5	Helicopter	Patch Clearcut	0.50	56
21010	16.1	Cable	Clearcut w/Green Tree Retention	0.90	419
21410	25.1	Helicopter	Patch Clearcut	0.35	254
21420	25.0	Helicopter	Patch Clearcut	0.35	253
21511	17.6	Cable	Clearcut w/Green Tree Retention	0.90	458
21520	23.5	Helicopter	Clearcut w/Green Tree Retention	0.90	611
21610	28.0	Helicopter	Single Tree Selection	0.40	309
21820	51.9	Cable	Clearcut w/Green Tree Retention	0.90	925
21830	22.8	Helicopter	Clearcut w/Green Tree Retention	0.90	481
21840	43.4	Helicopter	Clearcut w/Green Tree Retention	0.90	1002
21910	11.7	Helicopter	Clearcut w/Green Tree Retention	0.90	190
22010	26.0	Helicopter	Overstory Removal	0.50	229
22110	14.2	Helicopter	Single Tree Selection	0.40	103
22120	26.4	Helicopter	Single Tree Selection	0.40	217
22130	20.5	Helicopter	Clearcut w/Green Tree Retention	0.90	337
22140	57.5	Helicopter	Single Tree Selection	0.40	420
22210	22.1	Helicopter	Clearcut w/Green Tree Retention	0.90	394
22230	3.5	Helicopter	Clearcut w/Green Tree Retention	0.90	70
60420	30.7	Cable	Clearcut w/Green Tree Retention	0.90	921
60710	58.8	Helicopter	Group Selection	0.20	247
60810	4.5	Helicopter	Clearcut w/Green Tree Retention	0.90	114
60910	10.5	Helicopter	Clearcut w/Green Tree Retention	0.90	75
61011	18.4	Helicopter	Patch Clearcut	0.40	165
61012	9.7	Helicopter	Patch Clearcut	0.40	73
61020	26.3	Helicopter	Group Selection	0.20	98
61030	34.9	Cable	Clearcut w/Green Tree Retention	0.90	729
61040	8.6	Helicopter	Overstory Removal	0.70	109
61310	11.7	Cable	Clearcut w/Green Tree Retention	0.90	153
61311	1.6	Cable	Clearcut w/Green Tree Retention	0.90	27
61410	22.6	Shovel	Clearcut w/Green Tree Retention	0.90	503

**Indian River Timber Sale
Alternative C**

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
61510	29.6	Cable	Clearcut w/Green Tree Retention	0.90	693
62610	34.3	Cable	Overstory Removal	0.80	530
62611	19.9	Shovel	Clearcut w/Green Tree Retention	0.90	649
62620	10.8	Shovel	Single Tree Selection	0.20	82
62630	15.3	Shovel	Single Tree Selection	0.20	116
62640	8.8	Cable	Clearcut w/Green Tree Retention	0.90	301
62650	44.8	Cable	Clearcut w/Green Tree Retention	0.90	817
62710	20.9	Cable	Clearcut w/Green Tree Retention	0.90	479
62730	12.2	Cable	Clearcut w/Green Tree Retention	0.90	182
62810	32.1	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	503
62820	14.2	Cable	Patch Clearcut	0.40	103
62840	5.5	Cable	Clearcut w/Green Tree Retention	0.90	90
62850	19.6	Cable	Patch Clearcut	0.40	143
62860	13.7	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	225
63110	15.8	Shovel	Clearcut w/Green Tree Retention	0.90	259
63120	9.4	Helicopter	Overstory Removal	0.80	137
63510	18.8	Cable	Clearcut w/Green Tree Retention	0.90	307
63520	6.2	Cable	Overstory Removal	0.50	68
63820	50.5	Helicopter	Clearcut w/Green Tree Retention	0.90	788
63850	63.6	Helicopter	Clearcut w/Green Tree Retention	0.90	1456
63920	14.1	Helicopter	Clearcut w/Green Tree Retention	0.90	231
63960	12.3	Cable	Clearcut w/Green Tree Retention	0.90	188
63970	12.7	Cable	Clearcut w/Green Tree Retention	0.90	256
63971	11.9	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	286
64010	12.4	Cable	Clearcut w/Green Tree Retention	0.90	195
64020	64.5	Helicopter	Group Selection	0.20	193
64110	20.9	Helicopter	Clearcut w/Green Tree Retention	0.90	289
64210	28.3	Helicopter	Overstory Removal	0.80	390
64410	23.4	Cable	Clearcut w/Green Tree Retention	0.90	383
64420	9.4	Helicopter	Clearcut w/Green Tree Retention	0.90	155
64510	32.8	Helicopter	Overstory Removal	0.80	477
64530	3.4	Helicopter	Clearcut w/Green Tree Retention	0.90	50
65013	12.8	Helicopter	Clearcut w/Green Tree Retention	0.90	230
65020	62.8	Cable	Clearcut w/Green Tree Retention	0.90	965
Total	1856.3			Total	28711

**Indian River Timber Sale
Alternative D**

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
4120	58.7	Helicopter	Clearcut w/Green Tree Retention	0.90	965
20510	16.6	Helicopter	Clearcut w/Green Tree Retention	0.90	241
20610	13.7	Helicopter	Overstory Removal	0.80	190
20710	10.7	Cable	Single Tree Selection	0.50	43
20810	21.8	Helicopter	Overstory Removal	0.70	246
20812	4.6	Helicopter	Overstory Removal	0.70	59
20910	8.5	Helicopter	Patch Clearcut	0.50	56
21010	16.1	Cable	Clearcut w/Green Tree Retention	0.90	419
21100	10.0	Helicopter	Group Selection	0.20	58
21410	25.1	Helicopter	Patch Clearcut	0.35	254
21420	25.0	Helicopter	Patch Clearcut	0.35	253
21511	17.6	Cable	Clearcut w/Green Tree Retention	0.90	458
21520	23.5	Helicopter	Clearcut w/Green Tree Retention	0.90	611
21610	28.0	Helicopter	Single Tree Selection	0.40	309
21820	51.9	Cable	Clearcut w/Green Tree Retention	0.90	925
21830	22.8	Helicopter	Clearcut w/Green Tree Retention	0.90	481
21840	43.4	Helicopter	Clearcut w/Green Tree Retention	0.90	1002
21910	11.7	Helicopter	Clearcut w/Green Tree Retention	0.90	190
22010	26.0	Helicopter	Overstory Removal	0.50	229
22110	14.2	Helicopter	Single Tree Selection	0.40	103
22120	26.4	Helicopter	Single Tree Selection	0.40	217
22130	20.5	Helicopter	Clearcut w/Green Tree Retention	0.90	337
22140	57.5	Helicopter	Single Tree Selection	0.40	420
22210	22.1	Helicopter	Clearcut w/Green Tree Retention	0.90	394
22230	3.5	Helicopter	Clearcut w/Green Tree Retention	0.90	70
60420	30.7	Cable	Clearcut w/Green Tree Retention	0.90	921
60710	58.8	Helicopter	Group Selection	0.20	247
60810	4.5	Helicopter	Clearcut w/Green Tree Retention	0.90	114
60910	10.5	Helicopter	Clearcut w/Green Tree Retention	0.90	75
61011	18.4	Helicopter	Patch Clearcut	0.40	165
61012	9.7	Helicopter	Patch Clearcut	0.40	73
61020	26.3	Helicopter	Group Selection	0.20	98
61030	34.9	Cable	Clearcut w/Green Tree Retention	0.90	729
61040	8.6	Helicopter	Overstory Removal	0.70	109
61310	11.8	Cable	Clearcut w/Green Tree Retention	0.90	153
61311	1.6	Cable	Clearcut w/Green Tree Retention	0.90	27
61410	22.6	Shovel	Clearcut w/Green Tree Retention	0.90	503
61510	29.6	Cable	Clearcut w/Green Tree Retention	0.90	693
62610	34.3	Cable	Clearcut w/Green Tree Retention	0.90	597
62611	19.9	Shovel	Clearcut w/Green Tree Retention	0.90	649
62620	10.8	Shovel	Single Tree Selection	0.20	82
62630	15.3	Shovel	Single Tree Selection	0.20	116
62640	8.8	Cable	Clearcut w/Green Tree Retention	0.90	301
62650	44.8	Cable	Clearcut w/Green Tree Retention	0.90	817
62710	20.9	Cable	Clearcut w/Green Tree Retention	0.90	479
62730	12.2	Cable	Clearcut w/Green Tree Retention	0.90	182

**Indian River Timber Sale
Alternative D**

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
62810	32.1	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	503
62820	14.2	Cable	Patch Clearcut	0.40	103
62840	5.5	Cable	Clearcut w/Green Tree Retention	0.90	90
62850	19.6	Cable	Patch Clearcut	0.40	143
62860	13.7	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	225
63110	15.8	Shovel	Clearcut w/Green Tree Retention	0.90	259
63120	9.4	Helicopter	Overstory Removal	0.80	137
63510	18.8	Cable	Clearcut w/Green Tree Retention	0.90	307
63520	6.2	Cable	Overstory Removal	0.50	68
63820	50.5	Helicopter	Clearcut w/Green Tree Retention	0.90	788
63850	63.6	Helicopter	Clearcut w/Green Tree Retention	0.90	1456
63920	14.1	Helicopter	Clearcut w/Green Tree Retention	0.90	231
63960	12.3	Cable	Clearcut w/Green Tree Retention	0.90	188
63970	12.7	Cable	Clearcut w/Green Tree Retention	0.90	256
63971	11.9	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	286
64010	12.4	Cable	Clearcut w/Green Tree Retention	0.90	195
64020	64.5	Helicopter	Group Selection	0.20	193
64110	20.9	Helicopter	Clearcut w/Green Tree Retention	0.90	289
64210	28.3	Helicopter	Overstory Removal	0.80	390
64410	23.4	Cable	Clearcut w/Green Tree Retention	0.90	383
64420	9.4	Helicopter	Clearcut w/Green Tree Retention	0.90	155
64510	32.8	Helicopter	Overstory Removal	0.80	477
64530	3.4	Helicopter	Clearcut w/Green Tree Retention	0.90	50
65013	12.8	Helicopter	Clearcut w/Green Tree Retention	0.90	230
65020	62.8	Cable	Clearcut w/Green Tree Retention	0.90	965
Total	1,586.0			Total	24,027

**Indian River Timber Sale
Alternative E**

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
1511	5.3	Helicopter	Single Tree Selection	0.20	30
1520	10.9	Shovel	Clearcut w/Green Tree Retention	0.90	279
1610	14.2	Helicopter	Patch Clearcut	0.35	68
2310	9.7	Helicopter	Clearcut w/Green Tree Retention	0.90	144
2340	7.6	Helicopter	Clearcut w/Green Tree Retention	0.90	124
2710	45.9	Helicopter	Clearcut w/Green Tree Retention	0.90	601
3020	8.5	Helicopter	Clearcut w/Green Tree Retention	0.90	76
3222	46.9	Cable	Clearcut w/Green Tree Retention	0.90	997
3520	30.8	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	552
3530	32.3	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	646
3610	25.7	Cable	Clearcut w/Green Tree Retention	0.90	504
4011	5.4	Shovel	Single Tree Selection	0.20	39
4012	11.9	Helicopter	Single Tree Selection	0.20	69
4120	58.7	Helicopter	Clearcut w/Green Tree Retention	0.90	965
5040	45.3	Helicopter	Clearcut w/Green Tree Retention	0.90	731
5220	35.9	Helicopter	Group Selection	0.20	124
5410	19.5	Helicopter	Clearcut w/Green Tree Retention	0.90	301
20510	16.6	Helicopter	Clearcut w/Green Tree Retention	0.90	241
20610	13.7	Helicopter	Overstory Removal	0.80	190
20710	10.7	Cable	Single Tree Selection	0.50	43
20810	21.8	Helicopter	Overstory Removal	0.80	281
20910	8.5	Helicopter	Overstory Removal	0.80	90
21010	16.1	Cable	Single Tree Selection	0.50	233
21610	28.0	Helicopter	Single Tree Selection	0.20	154
21711	2.7	Cable	Clearcut w/Green Tree Retention	0.90	44
21811	8.5	Cable	Clearcut w/Green Tree Retention	0.90	128
21820	51.9	Cable	Clearcut w/Green Tree Retention	0.90	925
21830	22.8	Helicopter	Clearcut w/Green Tree Retention	0.90	481
21840	43.4	Helicopter	Clearcut w/Green Tree Retention	0.90	1002
21910	11.7	Helicopter	Clearcut w/Green Tree Retention	0.90	190
22010	26.0	Helicopter	Overstory Removal	0.80	367
22110	14.2	Helicopter	Single Tree Selection	0.40	103
22120	26.4	Helicopter	Single Tree Selection	0.40	217
22130	20.5	Helicopter	Clearcut w/Green Tree Retention	0.90	337
22140	57.5	Helicopter	Single Tree Selection	0.40	420
22210	22.1	Helicopter	Clearcut w/Green Tree Retention	0.90	394
22230	3.5	Helicopter	Clearcut w/Green Tree Retention	0.90	70
60710	58.8	Helicopter	Group Selection	0.20	247
60810	4.5	Helicopter	Clearcut w/Green Tree Retention	0.90	114
60910	10.5	Helicopter	Clearcut w/Green Tree Retention	0.90	75
61012	9.7	Helicopter	Group Selection	0.20	36
61020	26.3	Helicopter	Group Selection	0.20	98
61030	34.9	Cable	Clearcut w/Green Tree Retention	0.90	729
61040	8.6	Helicopter	Overstory Removal	0.70	109
61310	11.8	Cable	Clearcut w/Green Tree Retention	0.90	153
61311	1.6	Cable	Clearcut w/Green Tree Retention	0.90	27

**Indian River Timber Sale
Alternative E**

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
61410	22.6	Shovel	Clearcut w/Green Tree Retention	0.90	503
61510	29.6	Cable	Clearcut w/Green Tree Retention	0.90	693
62650	44.8	Cable	Clearcut w/Green Tree Retention	0.90	817
62710	20.9	Cable	Clearcut w/Green Tree Retention	0.90	479
62720	9.2	Cable	Clearcut w/Green Tree Retention	0.90	152
62730	12.2	Cable	Clearcut w/Green Tree Retention	0.90	182
62740	11.0	Cable	Clearcut w/Green Tree Retention	0.90	175
62820	14.2	Cable	Clearcut w/Green Tree Retention	0.90	233
62830	9.9	Helicopter	Overstory Removal	0.80	137
62840	5.5	Cable	Clearcut w/Green Tree Retention	0.90	90
62850	19.6	Cable	Clearcut w/Green Tree Retention	0.90	321
62860	13.7	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	225
63110	15.8	Shovel	Clearcut w/Green Tree Retention	0.90	259
63120	9.4	Helicopter	Overstory Removal	0.80	137
63510	18.8	Cable	Clearcut w/Green Tree Retention	0.90	307
63520	6.2	Cable	Patch Clearcut	0.20	27
63850	63.6	Helicopter	Clearcut w/Green Tree Retention	0.90	1456
63920	14.1	Helicopter	Clearcut w/Green Tree Retention	0.90	231
63940	9.2	Cable	Clearcut w/Green Tree Retention	0.90	127
63960	12.3	Cable	Clearcut w/Green Tree Retention	0.90	188
63970	12.7	Cable	Clearcut w/Green Tree Retention	0.90	256
63971	11.9	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	286
64010	12.4	Cable	Clearcut w/Green Tree Retention	0.90	195
64020	64.5	Helicopter	Patch Clearcut	0.35	338
64110	20.9	Helicopter	Clearcut w/Green Tree Retention	0.90	289
64210	28.3	Helicopter	Overstory Removal	0.80	390
64410	23.4	Cable	Clearcut w/Green Tree Retention	0.90	383
64420	9.4	Helicopter	Clearcut w/Green Tree Retention	0.90	155
64510	32.8	Helicopter	Overstory Removal	0.80	477
64530	3.4	Helicopter	Clearcut w/Green Tree Retention	0.90	50
65013	12.8	Helicopter	Clearcut w/Green Tree Retention	0.90	230
65020	62.8	Cable	Clearcut w/Green Tree Retention	0.90	965
Total	1665.3			Total	24502

**Indian River Timber Sale
Alternative F**

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
1511	5.3	Helicopter	Single Tree Selection	0.20	30
1520	10.9	Shovel	Clearcut w/Green Tree Retention	0.90	279
1610	14.2	Helicopter	Patch Clearcut	0.35	68
2220	31.9	Helicopter	Clearcut w/Green Tree Retention	0.90	468
2310	9.7	Helicopter	Clearcut w/Green Tree Retention	0.90	144
2340	7.6	Helicopter	Clearcut w/Green Tree Retention	0.90	124
2810	13.6	Cable	Clearcut w/Green Tree Retention	0.90	259
2820	58.4	Helicopter	Clearcut w/Green Tree Retention	0.90	1155
3010	13.1	Helicopter	Clearcut w/Green Tree Retention	0.90	203
3020	8.5	Helicopter	Clearcut w/Green Tree Retention	0.90	76
3112	22.5	Cable	Clearcut w/Green Tree Retention	0.90	350
3221	32.9	Cable	Clearcut w/Green Tree Retention	0.90	847
3222	46.9	Cable	Clearcut w/Green Tree Retention	0.90	997
3520	30.8	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	552
3530	32.3	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	646
3610	25.7	Cable	Clearcut w/Green Tree Retention	0.90	504
4011	5.4	Shovel	Single Tree Selection	0.20	39
4012	11.9	Helicopter	Single Tree Selection	0.20	69
4120	58.7	Helicopter	Clearcut w/Green Tree Retention	0.90	965
4420	38.2	Cable	Clearcut w/Green Tree Retention	0.90	994
4440	20.0	Helicopter	Clearcut w/Green Tree Retention	0.90	367
4620	60.9	Helicopter	Overstory Removal	0.80	1352
4710	18.7	Shovel	Single Tree Selection	0.20	143
4910	35.5	Helicopter	Clearcut w/Green Tree Retention	0.90	849
5010	19.3	Helicopter	Patch Clearcut	0.35	124
5011	17.5	Shovel	Patch Clearcut	0.35	160
5020	29.7	Helicopter	Patch Clearcut	0.35	137
5040	45.3	Helicopter	Clearcut w/Green Tree Retention	0.90	731
5080	23.8	Helicopter	Patch Clearcut	0.35	138
5220	35.9	Helicopter	Patch Clearcut	0.35	217
5410	19.5	Helicopter	Clearcut w/Green Tree Retention	0.90	301
5840	2.7	Helicopter	Overstory Removal	0.70	53
20510	16.6	Helicopter	Clearcut w/Green Tree Retention	0.90	241
20610	13.7	Helicopter	Overstory Removal	0.80	190
20710	10.7	Cable	Single Tree Selection	0.50	43
20810	21.8	Helicopter	Overstory Removal	0.80	281
20812	4.6	Helicopter	Overstory Removal	0.80	67
20910	8.5	Helicopter	Overstory Removal	0.80	90
21010	16.1	Cable	Single Tree Selection	0.50	233
21100	10.0	Helicopter	Patch Clearcut	0.35	101
21310	11.0	Helicopter	Patch Clearcut	0.35	112
21410	25.1	Helicopter	Patch Clearcut	0.35	254
21420	25.0	Helicopter	Patch Clearcut	0.35	253
21511	17.6	Helicopter	Clearcut w/Green Tree Retention	0.90	458
21520	23.5	Helicopter	Clearcut w/Green Tree Retention	0.90	611
21610	28.0	Helicopter	Single Tree Selection	0.40	309

21811	8.5	Cable	Clearcut w/Green Tree Retention	0.90	128
21820	51.9	Cable	Clearcut w/Green Tree Retention	0.90	925
21830	22.8	Helicopter	Clearcut w/Green Tree Retention	0.90	481
21840	43.4	Helicopter	Clearcut w/Green Tree Retention	0.90	1002
21910	11.7	Cable	Clearcut w/Green Tree Retention	0.90	190
22010	26.0	Helicopter	Overstory Removal	0.80	367
22110	14.2	Helicopter	Single Tree Selection	0.40	103
22120	26.4	Helicopter	Single Tree Selection	0.40	217
22130	20.5	Helicopter	Clearcut w/Green Tree Retention	0.90	337
22140	57.5	Helicopter	Single Tree Selection	0.40	420
22210	22.1	Helicopter	Clearcut w/Green Tree Retention	0.90	394
22230	3.5	Helicopter	Clearcut w/Green Tree Retention	0.90	70
60420	30.7	Cable	Clearcut w/Green Tree Retention	0.90	921
60710	58.8	Helicopter	Group Selection	0.20	247
60810	4.5	Helicopter	Clearcut w/Green Tree Retention	0.90	114
60910	10.5	Helicopter	Clearcut w/Green Tree Retention	0.90	75
61011	18.4	Helicopter	Patch Clearcut	0.40	165
61012	9.7	Helicopter	Group Selection	0.20	36
61020	26.3	Helicopter	Group Selection	0.20	98
61030	34.9	Cable	Clearcut w/Green Tree Retention	0.90	729
61040	8.6	Helicopter	Overstory Removal	0.70	109
61310	11.8	Cable	Clearcut w/Green Tree Retention	0.90	153
61311	1.6	Cable	Clearcut w/Green Tree Retention	0.90	27
61410	22.6	Shovel	Clearcut w/Green Tree Retention	0.90	503
61510	29.6	Cable	Clearcut w/Green Tree Retention	0.90	693
62610	34.3	Cable	Clearcut w/Green Tree Retention	0.90	597
62611	19.9	Shovel	Clearcut w/Green Tree Retention	0.90	649
62620	10.8	Shovel	Overstory Removal	0.80	330
62630	15.3	Shovel	Single Tree Selection	0.40	233
62650	44.8	Cable	Clearcut w/Green Tree Retention	0.90	817
62710	20.9	Cable	Clearcut w/Green Tree Retention	0.90	479
62730	12.2	Cable	Clearcut w/Green Tree Retention	0.90	182
62810	32.1	Cable/Helicopter	Patch Clearcut	0.40	230
62820	14.2	Cable	Clearcut w/Green Tree Retention	0.90	233
62830	9.9	Helicopter	Overstory Removal	0.80	137
62840	5.5	Cable	Clearcut w/Green Tree Retention	0.90	90
62850	19.6	Cable	Single Tree Selection	0.40	143
62860	13.7	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	225
63110	15.8	Shovel	Clearcut w/Green Tree Retention	0.90	259
63120	9.4	Helicopter	Overstory Removal	0.80	137
63510	18.8	Cable	Clearcut w/Green Tree Retention	0.90	307
63520	6.2	Cable	Overstory Removal	0.50	68
63820	50.5	Helicopter	Clearcut w/Green Tree Retention	0.90	788
63850	63.6	Helicopter	Clearcut w/Green Tree Retention	0.90	1456
63920	14.1	Helicopter	Clearcut w/Green Tree Retention	0.90	231
63960	12.3	Cable	Clearcut w/Green Tree Retention	0.90	188
63970	12.7	Cable	Clearcut w/Green Tree Retention	0.90	256
63971	11.9	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	286
64010	12.4	Cable	Clearcut w/Green Tree Retention	0.90	195
64020	64.5	Helicopter	Patch Clearcut	0.35	338
64110	20.9	Helicopter	Clearcut w/Green Tree Retention	0.90	289

64210	28.3	Helicopter	Overstory Removal	0.80	390
64410	23.4	Cable	Clearcut w/Green Tree Retention	0.90	383
64420	9.4	Helicopter	Clearcut w/Green Tree Retention	0.90	155
64510	32.8	Helicopter	Overstory Removal	0.80	477
64530	3.4	Helicopter	Clearcut w/Green Tree Retention	0.90	50
65013	12.8	Helicopter	Clearcut w/Green Tree Retention	0.90	230
65020	62.8	Cable	Clearcut w/Green Tree Retention	0.90	965
Total	2,355.2			Total	36,881

Appendix F

Subsistence

Appendix B

Continued

APPENDIX F

SUBSISTENCE

F-1. Regional Deer Demand as a Percentage of Deer Supply map.

F-2. Project Area Subsistence Harvest maps.

- A. Deer
- B. Salmon
- C. Finfish
- D. Marine Mammal
- E. Marine Invertebrate

F-3. Historical Clan Hunting Boundary maps.

- A. Angoon
- B. Hoonah

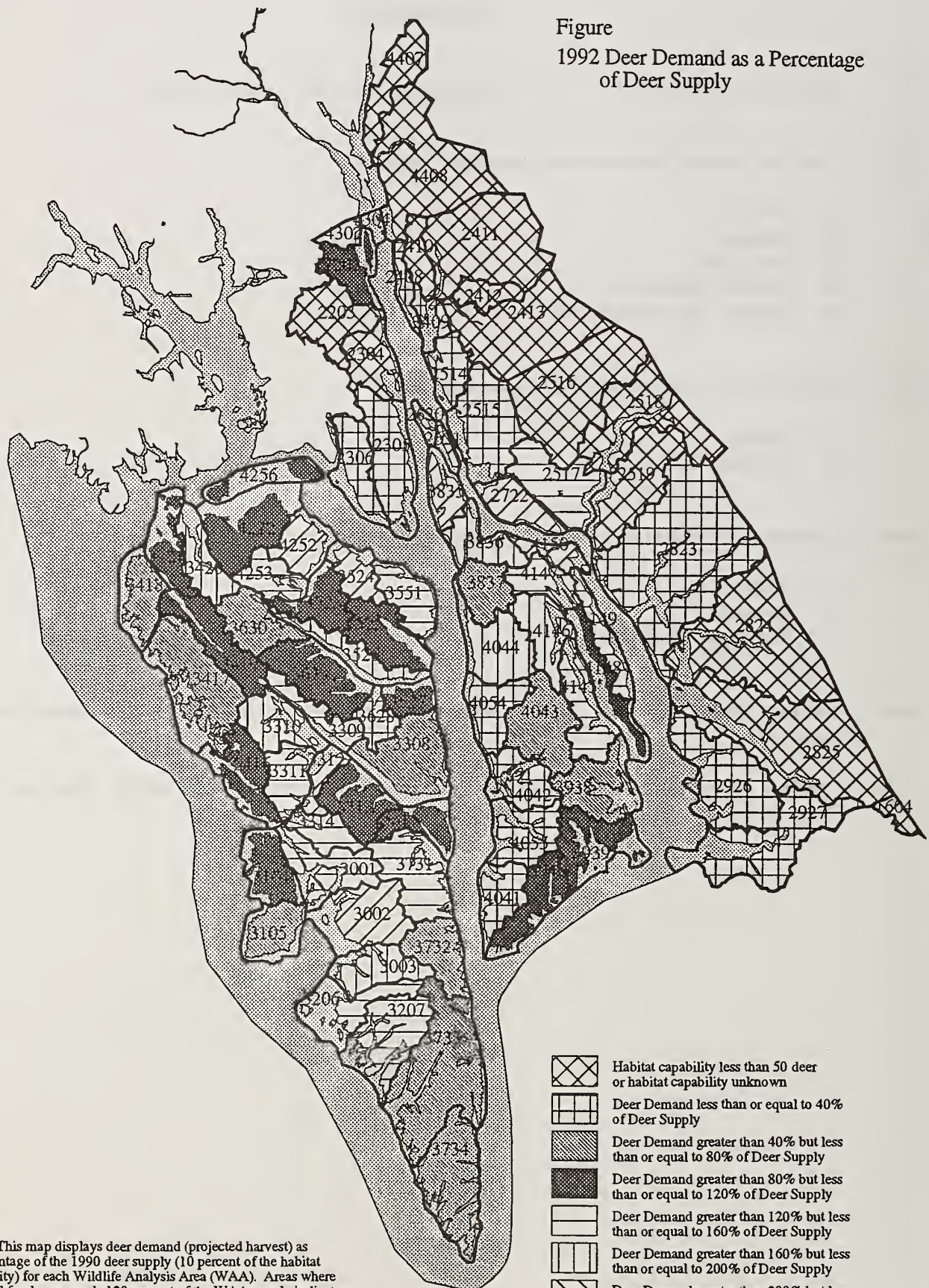
F-4. Community Subsistence Deer Hunting Area maps.

- A. Angoon
- B. Hoonah
- C. Tenakee Springs

F-5. Indian River Project Area Acres of Stem Exclusion 25 to 140 Years After Harvest.

F-6. Indian River Project Area Percent of Pre-harvest Old Growth Habitat in Stem Exclusion 25 to 140 Years After Harvest.

Figure
1992 Deer Demand as a Percentage
of Deer Supply

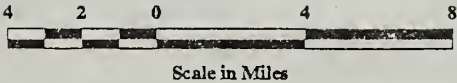
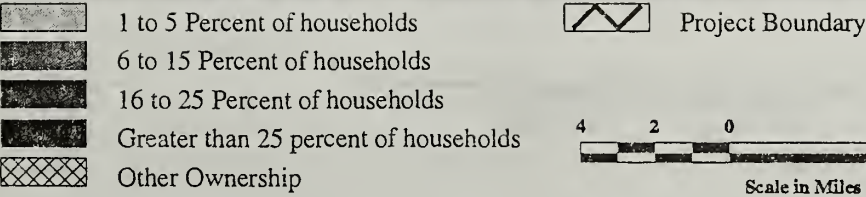


Note: This map displays deer demand (projected harvest) as a percentage of the 1990 deer supply (10 percent of the habitat capability) for each Wildlife Analysis Area (WAA). Areas where demand for deer exceeds 120 percent of the WAA supply indicate that existing deer habitat is not sufficient to sustain present harvest levels. Demand equals mean deer harvested by WAA for the years 1987-1992. Harvest data is from Alaska Dept. of Fish and Game (ADF&G) 1987-1992 deer hunter surveys; deer habitat capability estimates are from Tongass Land Management Plan Revision (TLMRP, 1991). Source: ADF&G Div. of Subsistence, Tongass National Forest, Chatham Area GIS.

- Habitat capacity less than 50 deer or habitat capacity unknown
- Deer Demand less than or equal to 40% of Deer Supply
- Deer Demand greater than 40% but less than or equal to 80% of Deer Supply
- Deer Demand greater than 80% but less than or equal to 120% of Deer Supply
- Deer Demand greater than 120% but less than or equal to 160% of Deer Supply
- Deer Demand greater than 160% but less than or equal to 200% of Deer Supply
- Deer Demand greater than 200% but less than or equal to 240% of Deer Supply
- Deer Demand greater than 240% of Deer Supply

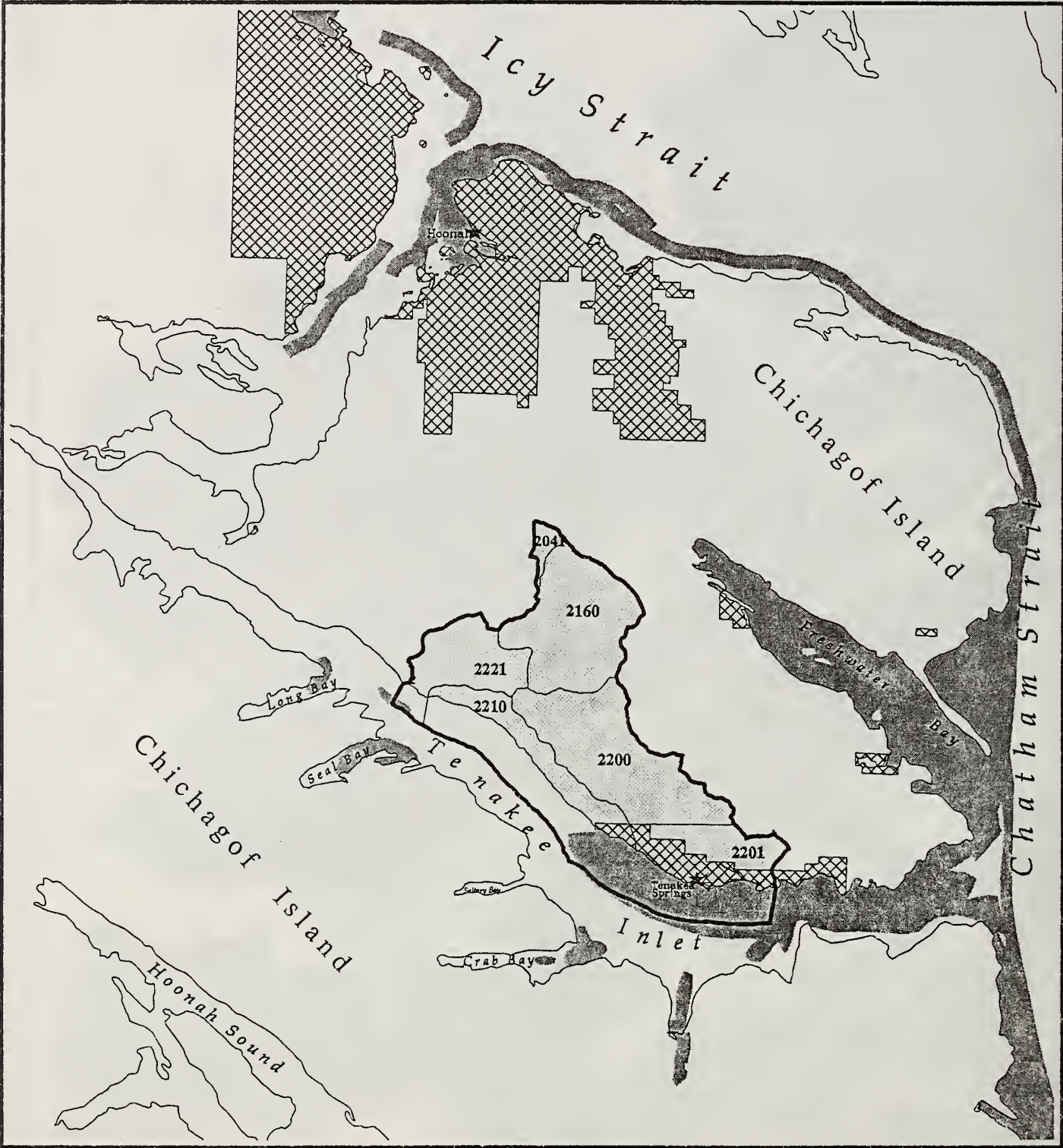
12 6 0 12 24
Scale in Miles





Indian River Regional Subsistence Deer Harvest

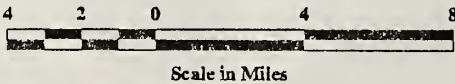


Source: TRUCS 1988 and Chatham Area GIS

Indian River Regional Subsistence Salmon Harvest

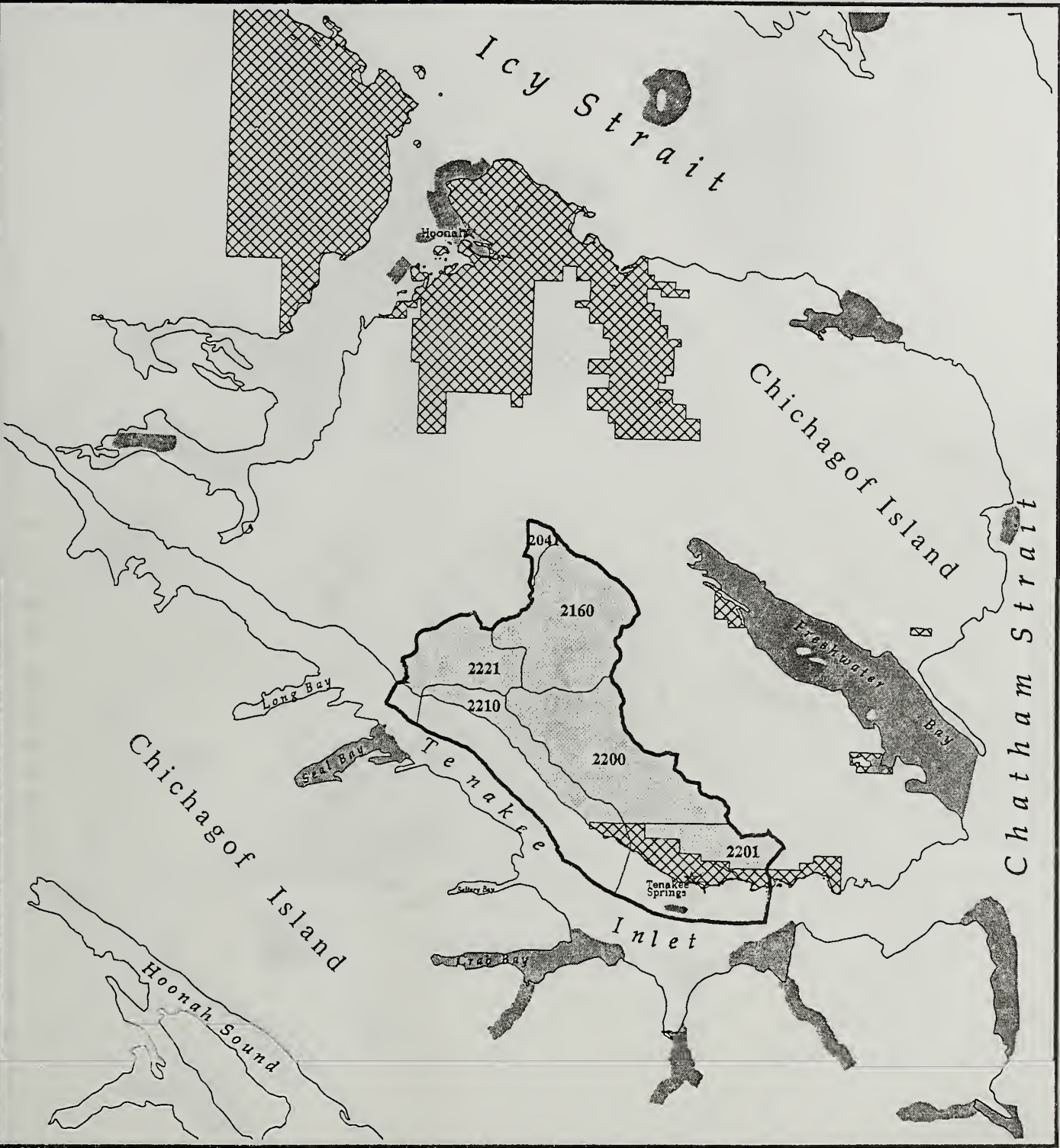






-  Project Boundary
-  Project Area
-  Other Ownership
-  Areas Where one or more Households Have ever Fished for Salmon



Source: TRUCS 1988 and Chatham Area GIS

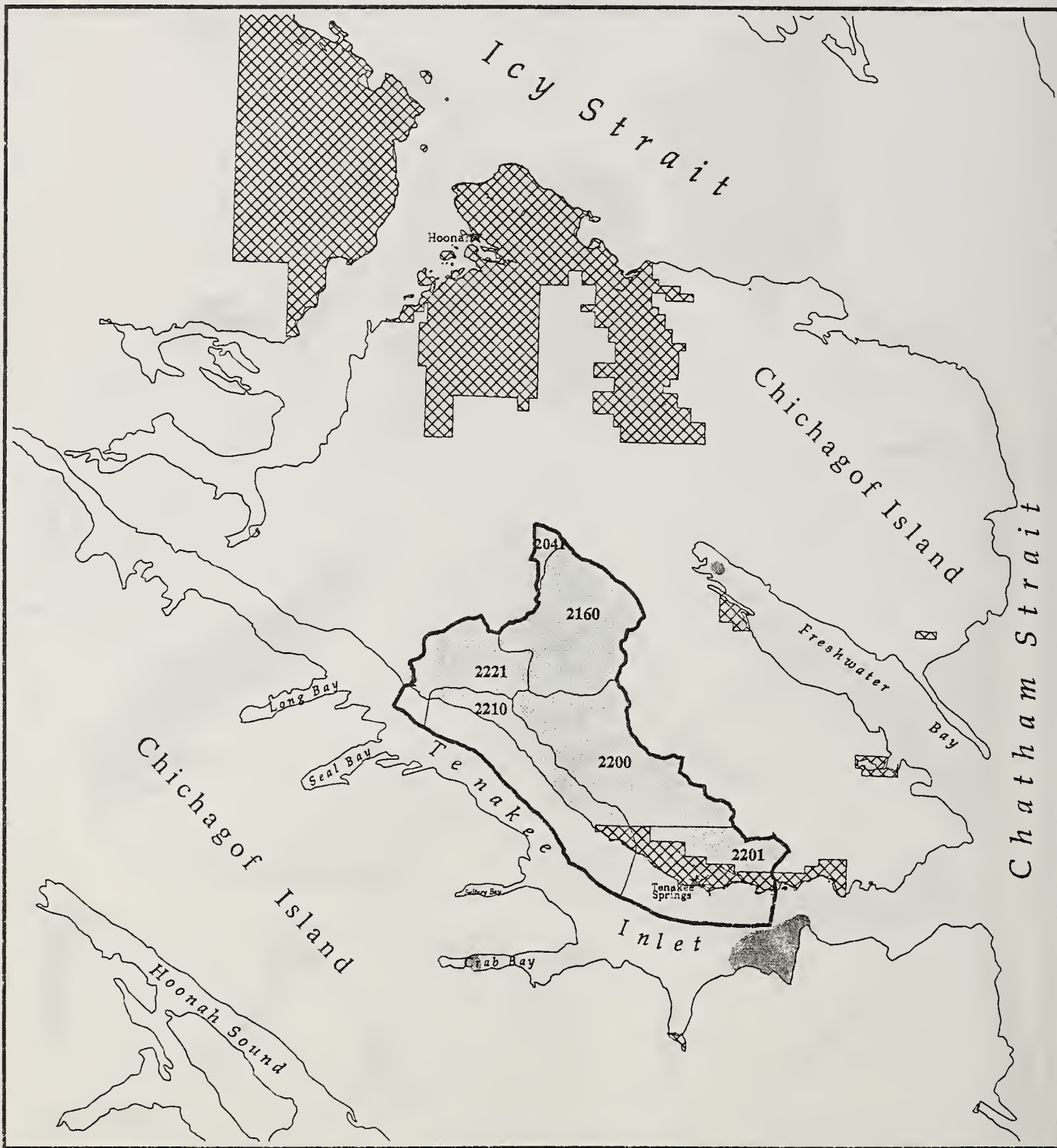
Indian River Regional Subsistence Finfish Harvest







-  Project Boundary
-  Project Area
-  Other Ownership
-  Areas Where one or more Households Have ever Fished for Finfish

Source: TRUCS 1988 and Chatham Area GIS

Indian River Regional Subsistence Marine Mammal Harvest



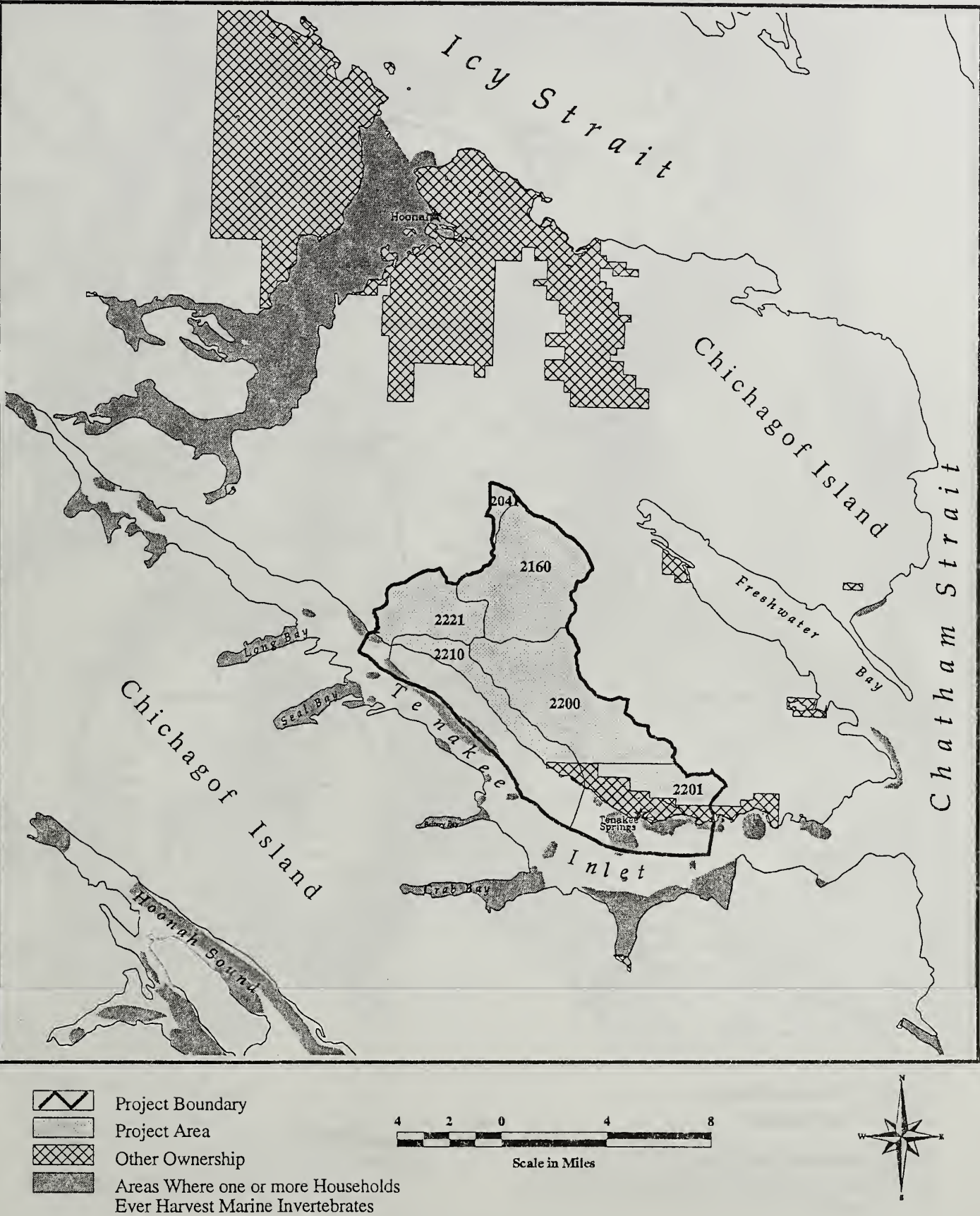
-  Project Boundary
-  Project Area
-  Other Ownership
-  Areas Where one or more Households Ever Harvest Marine Mammals

4 2 0 4 8
Scale in Miles



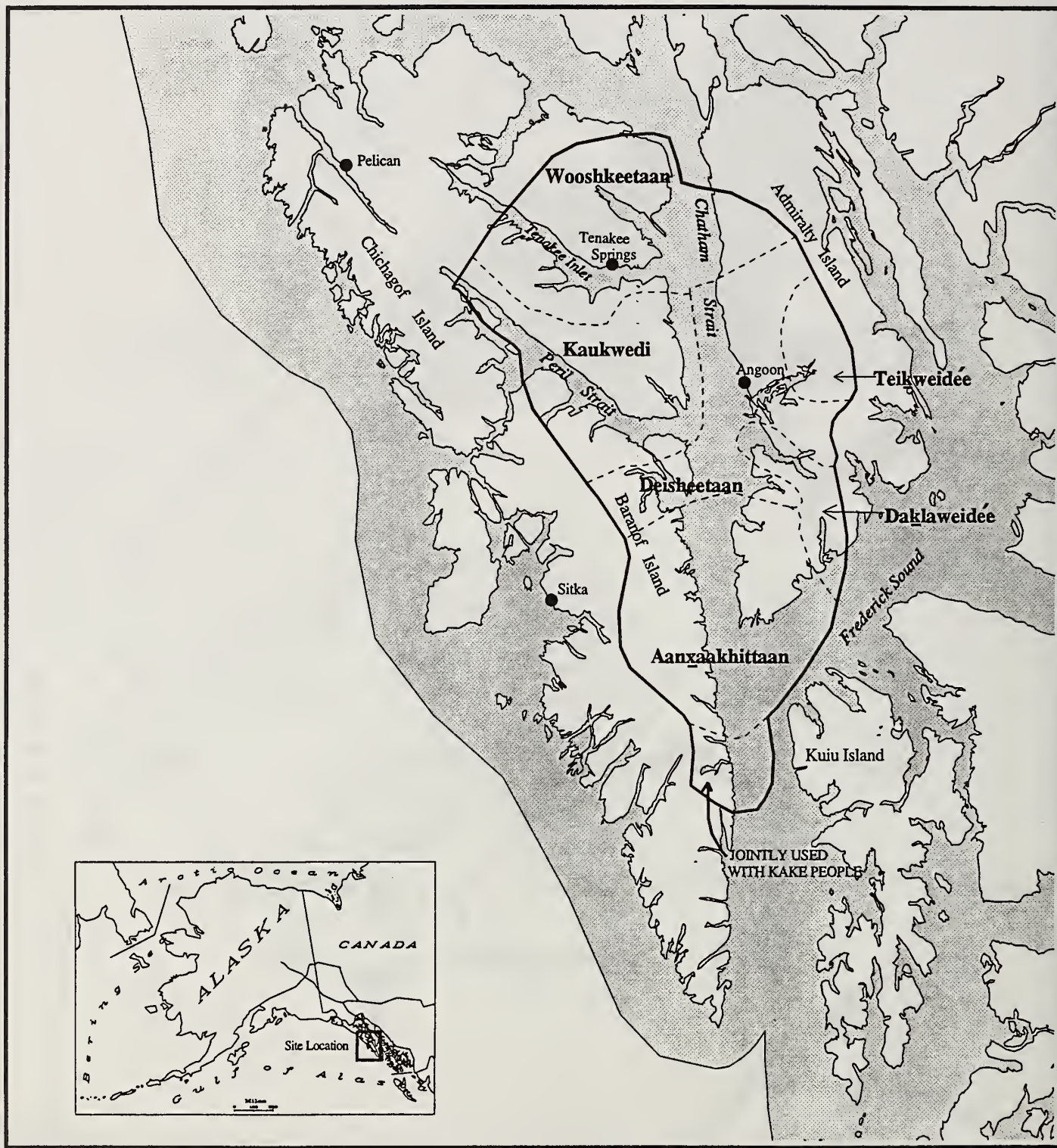
Source: TRUCS 1988 and Chatham Area GIS



Indian River Regional Subsistence Marine Invertebrate Harvest



Source: TRUCS 1988 and Chatham Area GIS

Historical Clan Hunting Boundaries of Angoon Tlingits



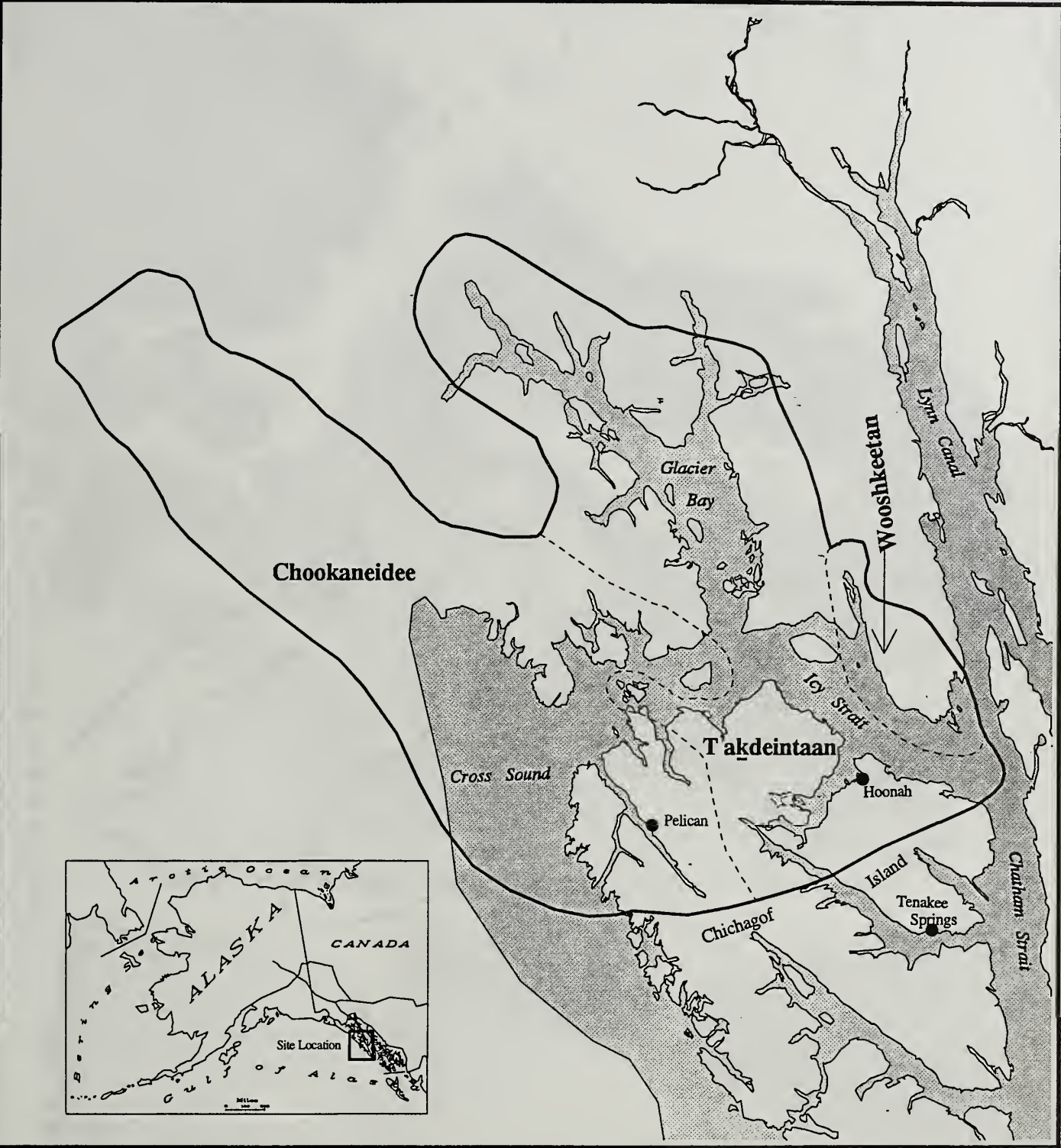
-  Territorial Boundary
-  Clan Boundary



Source: Goldschmidt and Haas, 1946

Note: Clan name spelling from Sitka Native Education Program and N. Lawson, 1996

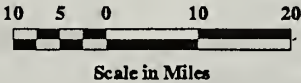


Historical Clan Ownership and Use Rights Boundaries of Hoonah Tlingit

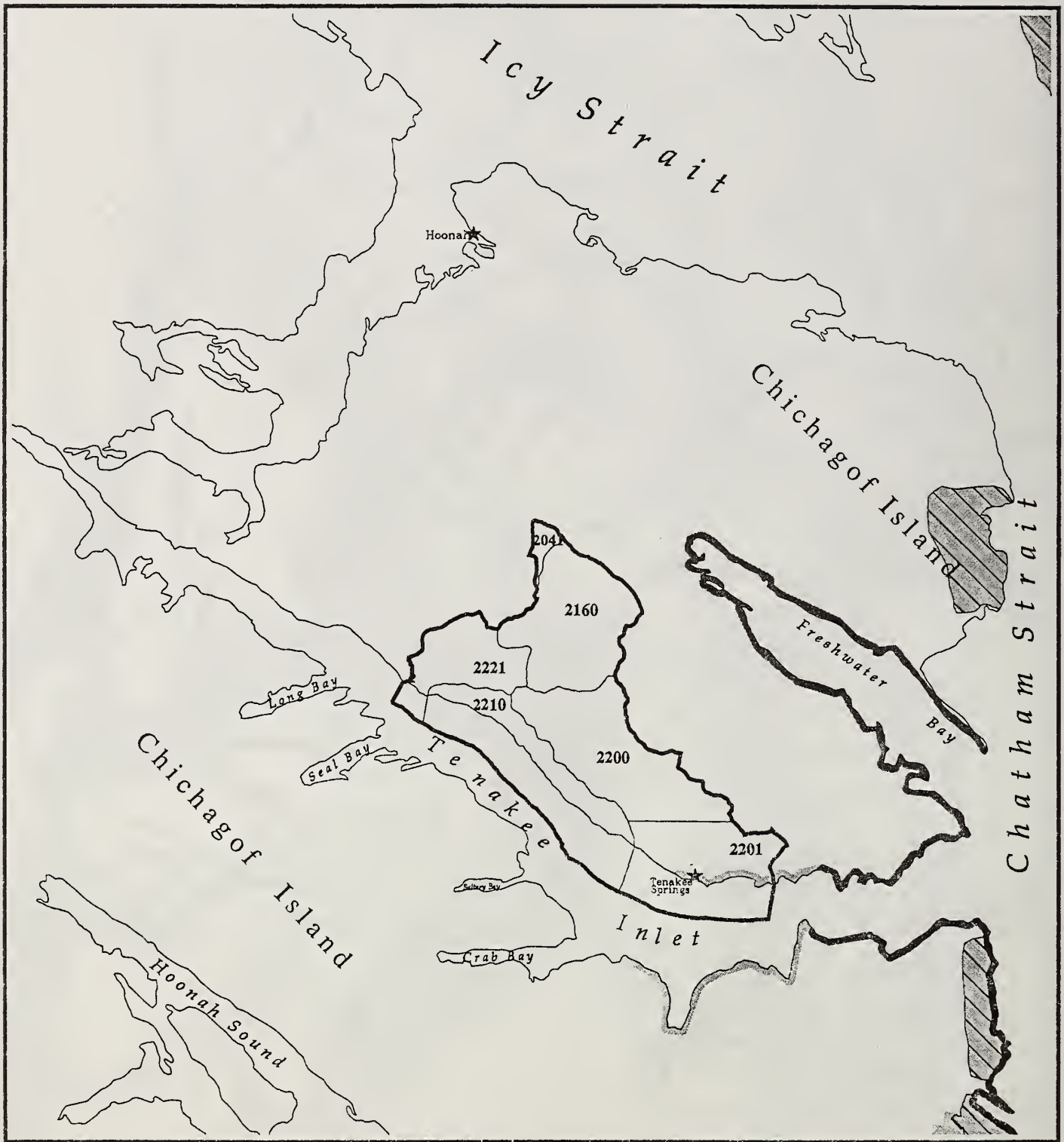








-  Territorial Boundary
-  Clan Boundary

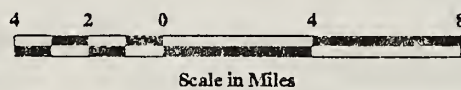
Source: Schroeder and Kookesh, 1990
Adapted from Goldschmidt and Haas, 1946



Angoon Subsistence Deer Hunting Areas



-  1 to 5 Percent of households
-  6 to 15 Percent of households
-  16 to 25 Percent of households
-  Greater than 25 percent of households
-  Most reliable, most often used areas
-  Project Boundary



Source: TRUCS 1988 and Chatham Area GIS







Hoonah Subsistence Deer Hunting Areas

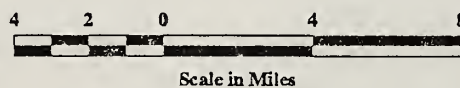


Source: TRUCS 1988 and Chatham Area GIS

Tenakee Springs Subsistence Deer Hunting Areas



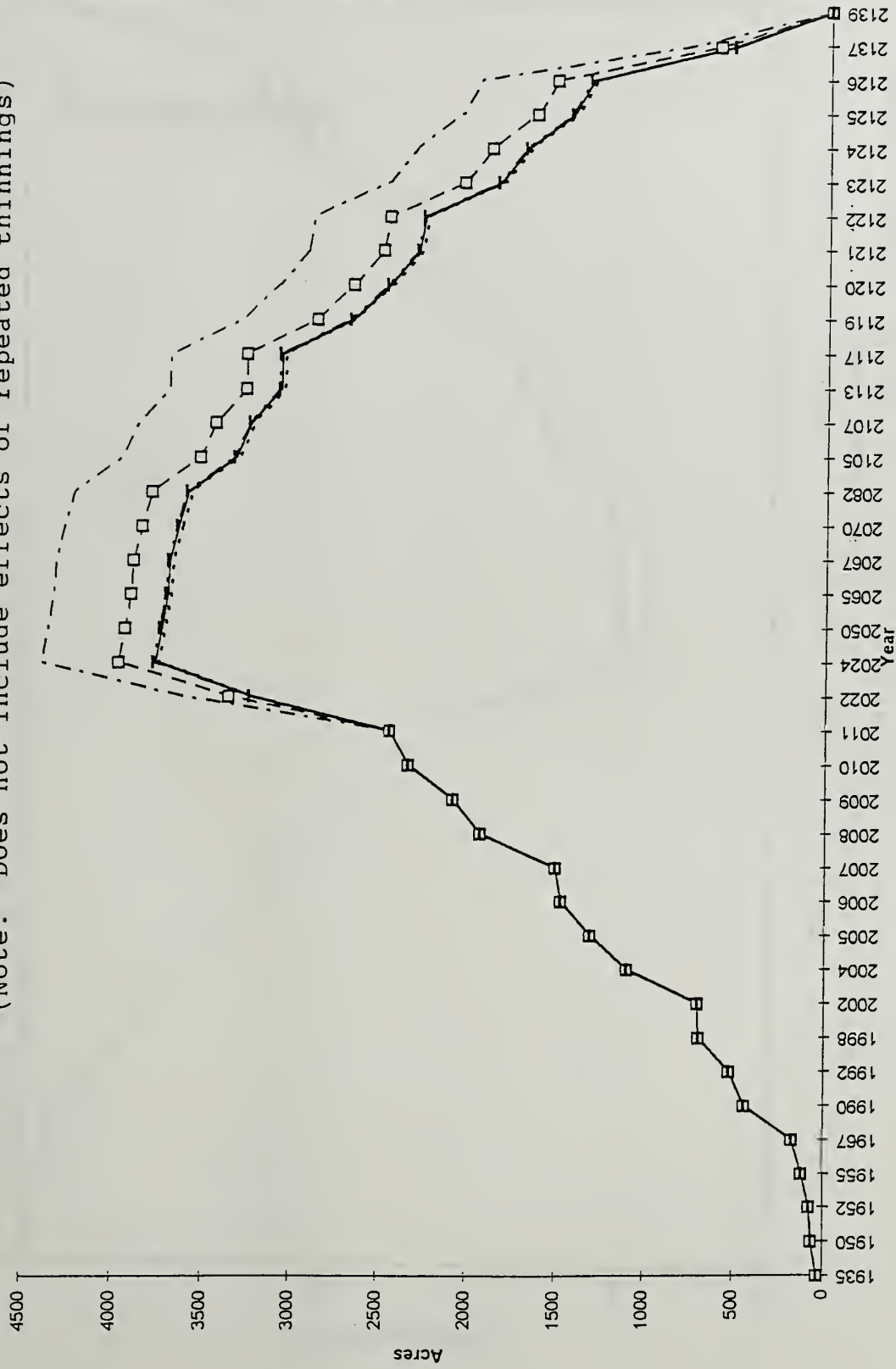
-  1 to 5 Percent of households
-  6 to 15 Percent of households
-  16 to 25 Percent of households
-  Greater than 25 percent of households
-  Most reliable, most often used areas
-  Project Boundary



Source: TRUCS 1988 and Chatham Area GIS

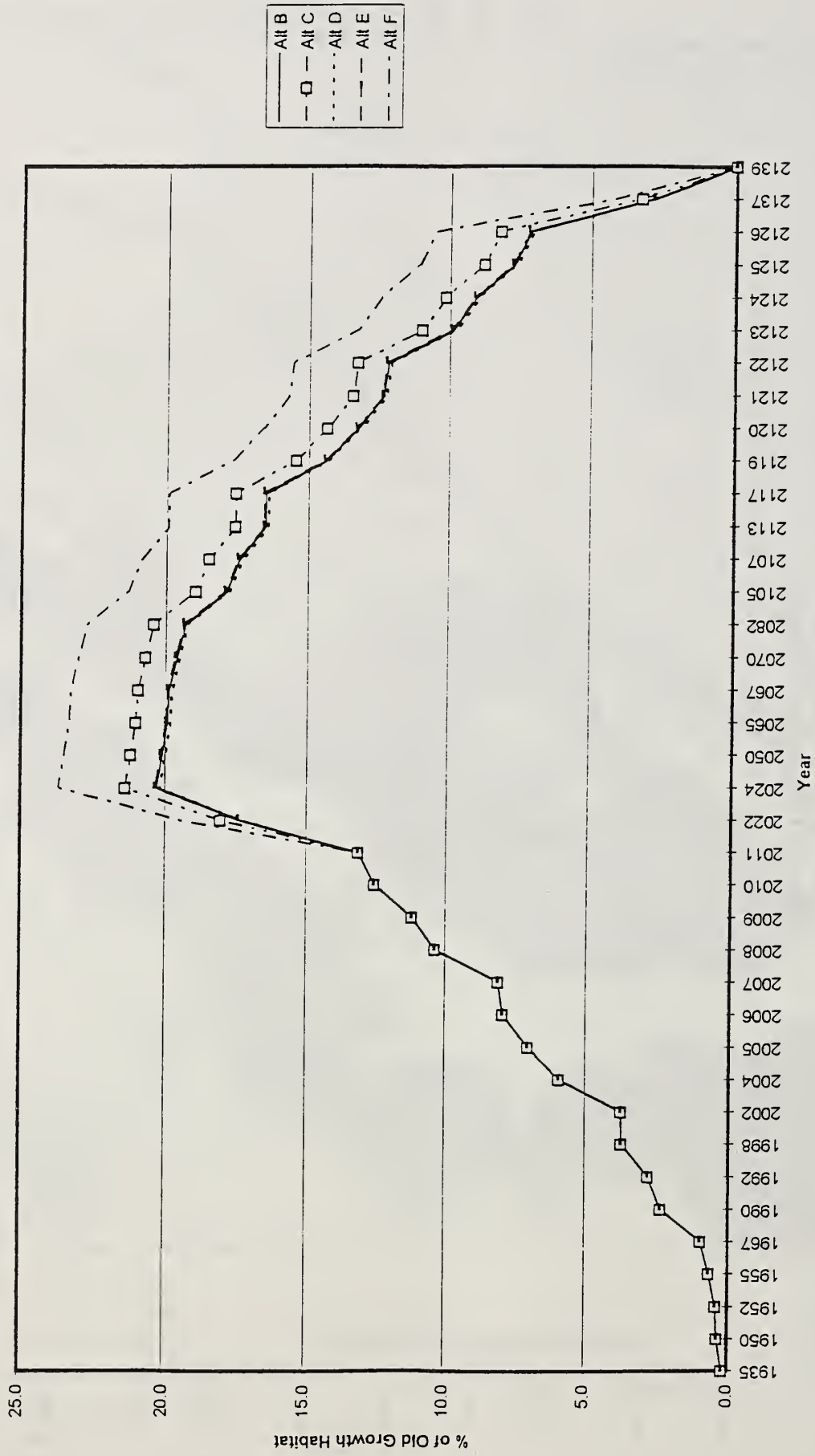
Indian River Project Area Acres of Stem Exclusion 25 to 140 years after harvest

(Note: Does not include effects of repeated thinnings)



In this example, Indian River Sale Area were considered to be harvested in 1997 (60%) and 1999 (40%).

INDIAN RIVER PROJECT AREA: PERCENT OF SECOND GROWTH HABITAT
IN STEM EXCLUSION 25 TO 140 YEARS AFTER HARVEST
(Note: Does not include effects of repeated thinnings)



In this example, Indian River Sale Area were consider to be at harvested in 1997(60%) and 1999(40%).

Appendix G

Recreation

Abstract

1. Introduction

2. Methodology

Indian River

Proposed Timber Sale

Recreation Existing Situation

Recreation Opportunity Spectrum

- Semi-Primitive Non-motorized
- Semi-Primitive Motorized
- Roaded Modified
- Rec-Place
- Trail
- Rec-sites
- Existing Harvest Units
- Proposed Harvest Units
- Existing Roads
- Proposed Roads
- Class 1 Streams
- Non-National Forest System Lands
- VCU Boundaries
















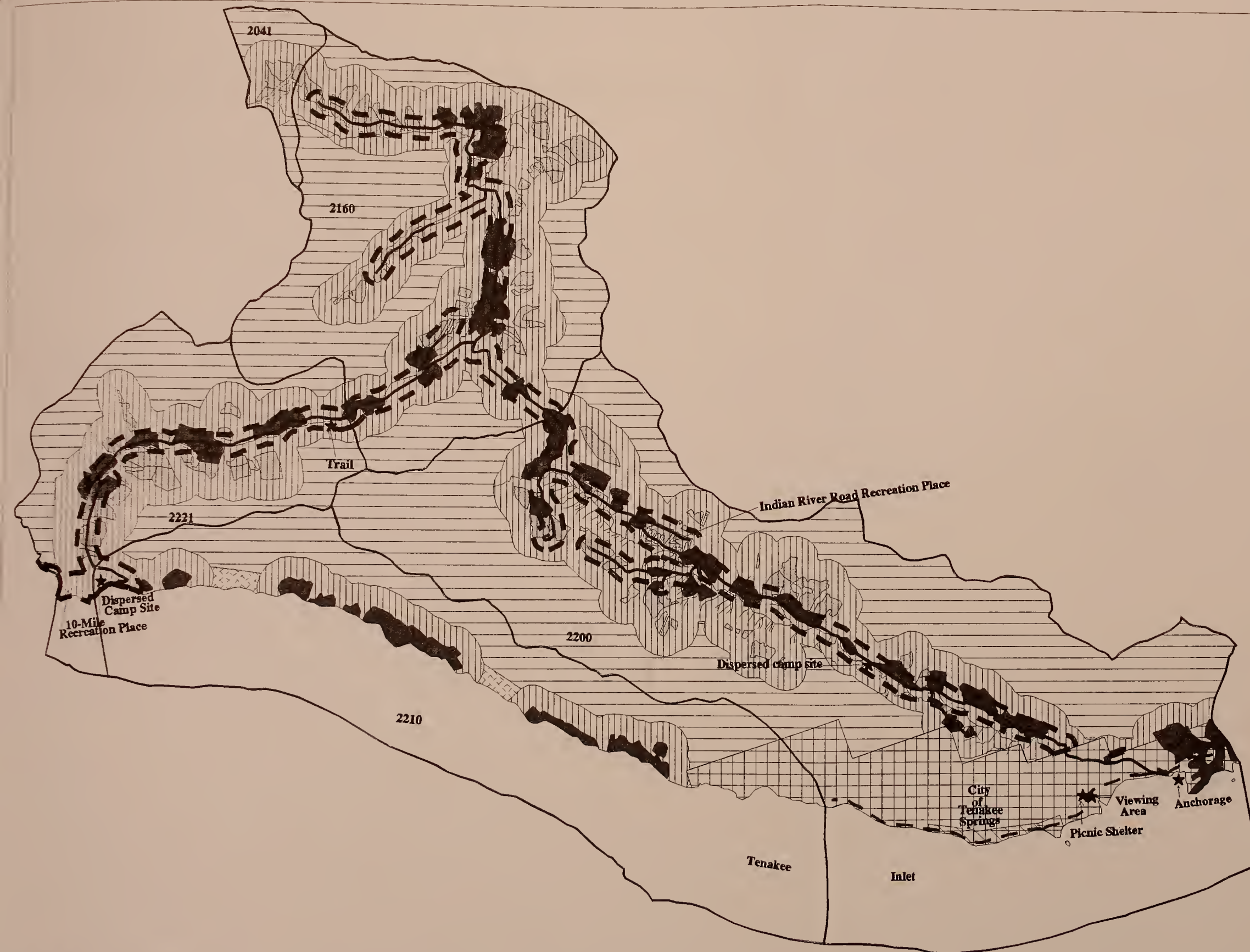
Indian River

Proposed Timber Sale

Recreation Alternative B

Recreation Opportunity Spectrum

-  Semi-Primitive Non-motorized
-  Semi-Primitive Motorized
-  Roaded Modified
-  Rec-Place
-  Trail
-  Rec-sites
-  Existing Harvest Units
-  Proposed Harvest Units
-  Existing Roads
-  Proposed Roads
-  Class 1 Streams
-  Non-National Forest System Lands
-  VCU Boundaries
















Indian River

Proposed Timber Sale

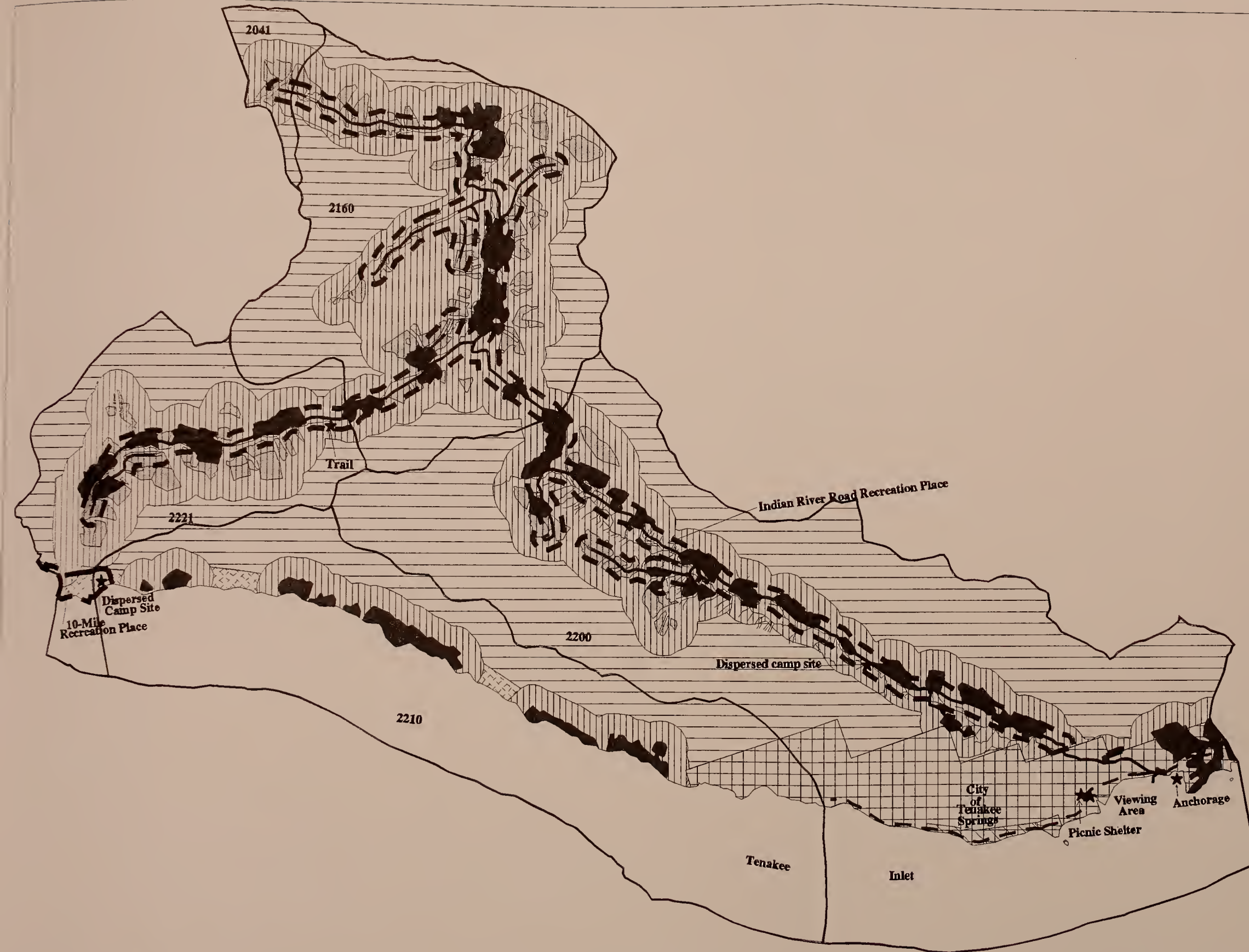
Recreation Alternative C

Recreation Opportunity Spectrum

-  Semi-Primitive Non-motorized
-  Semi-Primitive Motorized
-  Roaded Modified
-  Rec-Place
-  Trail
-  Rec-sites
-  Existing Harvest Units
-  Proposed Harvest Units
-  Existing Roads
-  Proposed Roads
-  Class 1 Streams
-  Non-National Forest System Lands
-  VCU Boundaries



Mapscale 1:84480



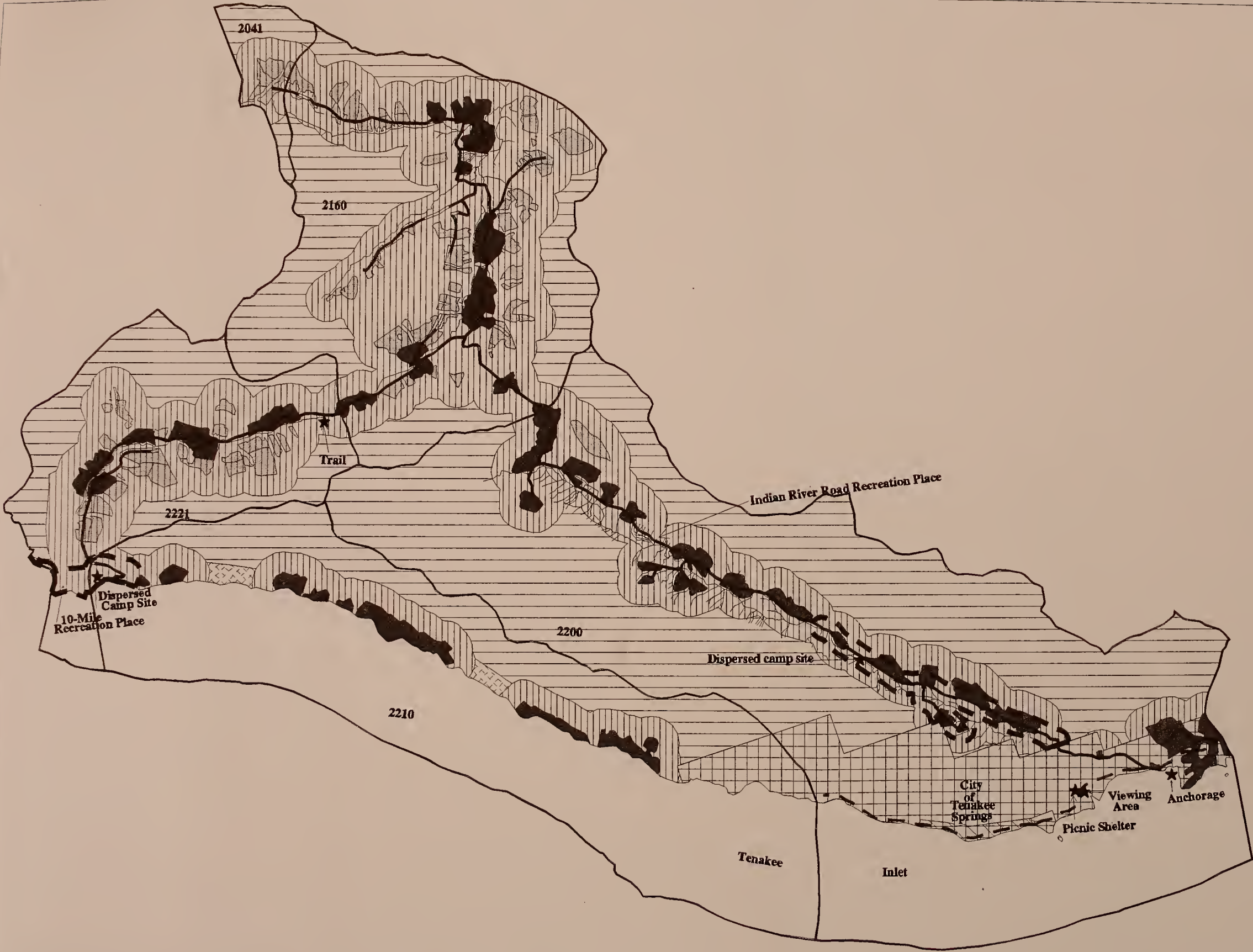
Indian River

Proposed Timber Sale

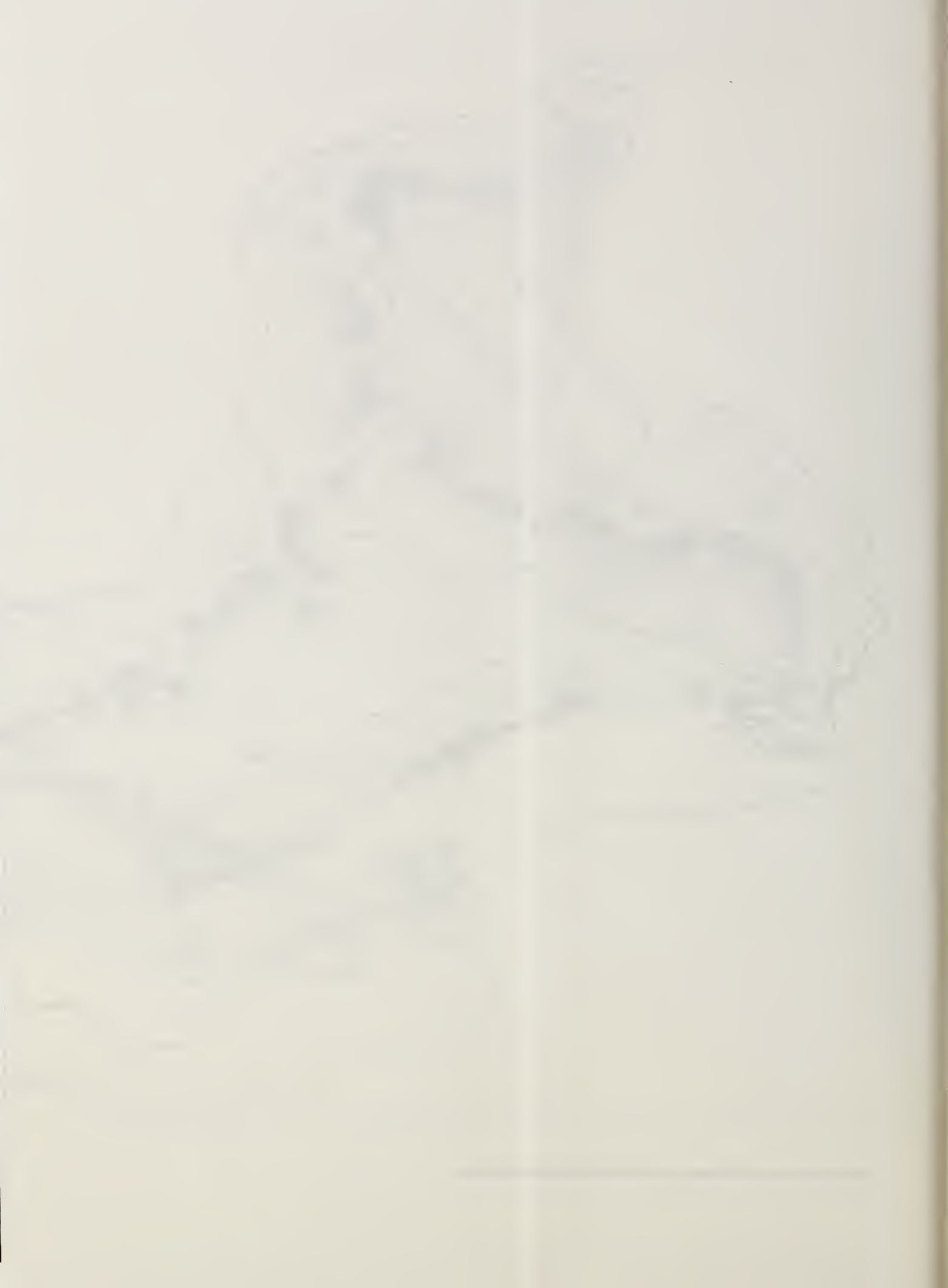
Recreation Alternative D

Recreation Opportunity Spectrum

- Semi-Primitive Non-motorized
- Semi-Primitive Motorized
- Roaded Modified
- Rec-Place
- Trail
- Rec-sites
- Existing Harvest Units
- Proposed Harvest Units
- Existing Roads
- Proposed Roads
- Class 1 Streams
- Non-National Forest System Lands
- VCU Boundaries



Mapscale 1:84480
















Indian River

Proposed Timber Sale

Recreation Alternative E

Recreation Opportunity Spectrum

-  Semi-Primitive Non-motorized
-  Semi-Primitive Motorized
-  Roaded Modified
-  Rec-Place
-  Trail
-  Rec-sites
-  Existing Harvest Units
-  Proposed Harvest Units
-  Existing Roads
-  Proposed Roads
-  Class 1 Streams
-  Non-National Forest System Lands
-  VCU Boundaries



1 0.5 0 1 2 Miles














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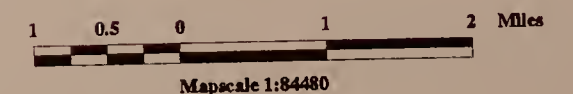
Indian River

Proposed Timber Sale

Recreation Alternative F

Recreation Opportunity Spectrum

-  Semi-Primitive Non-motorized
-  Semi-Primitive Motorized
-  Roaded Modified
-  Rec-Place
-  Trail
-  Rec-sites
-  Existing Harvest Units
-  Proposed Harvest Units
-  Existing Roads
-  Proposed Roads
-  Class 1 Streams
-  Non-National Forest System Lands
-  VCU Boundaries



Mapscale 1:84480

Appendix H

Landtype Associations and Biodiversity

Abstract

The purpose of this study was to investigate the effect of a 12-week training program on the physical and psychological health of sedentary individuals. The study was conducted in a laboratory setting and involved 30 participants who were randomly assigned to either a control group or a training group. The training group participated in a 12-week program of aerobic and resistance training, while the control group remained sedentary. The results of the study showed that the training group experienced significant improvements in physical health, including increased cardiovascular fitness, muscle strength, and endurance. Additionally, the training group also experienced improvements in psychological health, including reduced stress and improved mood. The findings of this study suggest that a 12-week training program can have a positive impact on the physical and psychological health of sedentary individuals.

LANDTYPE ASSOCIATION DESCRIPTIONS

Alpine and subalpine summits and ridges

Geomorphic Setting. This unit includes alpine and subalpine areas on both gently sloping summits and steep side slopes (10 to 120% slopes). The summits are both rounded and rugged. Many of the rugged summits are limestone and have many karst features. The soils are shallow and primarily formed in residuum or colluvium. On some of the flatter benches, the soils are slightly deeper and may have an organic epipedon (USDA Forest Service 1986).

Hydrologic function. This LTA is both a conveyor and a receptor. Sheet flow and shallow pools appear temporarily during large storm events. This association conveys water to downslope landscapes. These areas accumulate considerable snow during some winters, which often lasts into May (Garvet et al. Unpublished map). Water primarily moves via surface and subsurface runoff in summit areas with bedrock other than limestone. Where limestone occurs, water also moves through subsurface fissures and streams (USDA Forest Service in prep). This water therefore often bypasses the downslope Steep Forested Mountain Slopes LTA to resurface as springs and resurgent streams above the valley floor. The soils are moderately well to somewhat poorly drained.

Vegetation, disturbance, and successional pathways. These summits and ridges generally have extensive areas of heath plant community types. Crowberry (*Empetrum nigrum*), Luetkea (*Luetkea pectinata*), Mertens mountain-heather (*Cassiope mertensiana*) and deer cabbage (*Fauria crista-galli*) are common species. Where soil has developed, these alpine and subalpine slopes have a rich diversity of plants especially on the calcareous summits. Mountain hemlock (*Tsuga mertensiana*) with minor amounts of Sitka spruce (*Picea sitchensis*) occurs in protected areas as a dwarf forest called *krummholz*. Tall blueberry (*Vaccinium spp.*) and copperbush (*Cladanthamnus pyrolaeiflorus*) are scattered among the trees (Martin et al. 1995). Alpine meadows, rock outcrop, and fellfield communities also occur. Disturbance processes include snow creep and wind effects. Successional changes are slow and plant communities are relatively fragile.

Brushfields

Geomorphic Setting. These snow accumulation and avalanche slopes are dominated by communities of Sitka alder and salmonberry. The steep avalanche slopes (50-140% slope) occur below summits and typically grade into Forested Mountain Slopes, depending on the slope and the avalanching that occurs. Avalanche slopes may extend to the valley floor in some areas. Mass wasting events are partially responsible for location and extent of this association. Water flowing over an impermeable layer probably initiates the mass wasting events. The soils are shallow to bedrock and have a high percentage of rock fragments. The soils are deeper in depositional areas with moderate slopes (USDA Forest Service 1986).

Hydrologic function. These surfaces are moderately well drained, and often have ample water running through the soil parallel to the slope. This association is a conveyor and donor of water to downslope associations (USDA Forest Service 1986).

Vegetation, disturbance, and successional pathways. These brushfields are dominated by Sitka alder (*Alnus sinuata*) and salmonberry (*Rubus spectabilis*). Other common species include lady fern (*Athyrium filix-femina*), Sitka willow (*Salix sitchensis*), stink currant (*Ribes bracteosum*), and false hellebore (*Veratrum viride*). Inclusions of subalpine meadows and *krummholz* mountain hemlock communities also occur. In some areas, Sitka spruce is slowly invading the brushfields (M. Shephard, pers. observ.). This may be due to less snow accumulation and avalanching since the end of the Little Ice Age (approximately 1850).

Steep Forested Mountain Slopes

Geomorphic Setting. These forests occur primarily on steep slopes (50%+) on parent material of colluvium and residuum (Martin et al. 1995). Some of the steepest areas probably originated via disturbances such as Little Ice Age avalanche tracks. Slopes are commonly broken or frequently dissected by small streams. This is a common type within this Subsection.

Hydrologic function. This association is very steep and hence water is conveyed quickly to downslope LTAs such as the Colluvial/Fluvial/Coastal Surfaces landtype association. The soils are shallow to very deep and well to moderately well drained (USDA Forest Service 1986).

Vegetation, disturbance, and successional pathways. The dominant overstory species are Sitka spruce (*Picea sitchensis*), mountain hemlock (*Tsuga mertensiana*), and western hemlock (*Tsuga heterophylla*). Devil's club (*Oplopanax horridum*), blueberry (*Vaccinium* spp.) and copperbush (*Cladothamnus pyrolaeiflorus*) [at higher elevations] are the primary tall shrubs (Martin et al. 1995). There also are open stands of mountain hemlock at higher elevations. On benches of broken slopes, mixed conifer open forest and nonforested wetland areas occur as inclusions in this LTA. Disturbance factors such as wind, snow, and soil movement are frequent enough to maintain Sitka spruce as a dominant tree species in this association.

Moderately Steep Forested Mountain Slopes

Geomorphic Setting. This unit contains productive forested slopes (10-45% slope) on parent material of till, colluvium, and residuum.

Hydrologic function. Water moves through these slopes, but not as quickly as it does through the Steep Forested Mountain Slopes. This association is less steep and contains more benches than the Steep Forested Mountain Slopes.

Vegetation, disturbance, and successional pathways. The dominant overstory species are western hemlock (*Tsuga heterophylla*), Sitka spruce (*Picea sitchensis*), and yellowcedar (*Chamaecyparis nootkatensis*). A wide variety of plant associations from the western hemlock, western hemlock-yellowcedar, and mixed conifer series occurs on this association. Devil's club (*Oplopanax horridum*) and blueberry (*Vaccinium* spp.) are the dominant tall shrubs. Bench inclusions may have mixed conifer open forest or nonforested wetland vegetation.

Forested Hills

Geomorphic setting. This landscape is primarily located on compact till. Organic soils develop in swales where drainage is slowed because of low permeability and gentle terrain. The soils are shallow over the till on slopes. These areas have no direct connection to alpine summits or ridges.

Hydrologic function. These areas are receptors and conveyors of water. Numerous depressions and swales are very poorly drained, while areas of colluvium are well drained (USDA Forest Service 1986).

Vegetation, disturbance, and successional pathways. The forests are moderately to marginally productive for timber. Two common plant associations are western hemlock/blueberry and mixed conifer/blueberry. The vegetation mosaic is slowly changing as some areas are invaded by *Sphagnum* moss and other wetland species; while other areas slowly accumulate enough upland microsites that upland species dominate. Skunk cabbage (*Lysichitum americanum*) is a common forb in the wetter areas.

Colluvial/Fluvial/Coastal Surfaces

Geomorphic setting. Fluvial and colluvial processes are the primary influences along the flood plains, dissected footslopes, alluvial fans, uplifted beaches and rock headlands of the study area. The substrate within the river corridors is primarily gravel and coarse sand alluvium with inclusions of colluvium. Footslopes also have mineral soils with colluvium and alluvium in fan areas. Uplifted beach sediments are generally sand and gravel. These surfaces are all well to moderately well drained.

Hydrologic function. Except for the gently sloping or flat uplifted beaches, this landtype association is a major conveyor of water downslope. Within the flood plains, the soils are generally well drained near present channels. Further away from current channels, the soils may be somewhat poorly drained because of old overbank deposits and beaver activity. Soil development is dependent on surface age, material size, degree of material sorting, and flooding disturbance periodicity. Uplifted beaches are receptors of upslope water and conveyors of water to tidal flats and estuaries.

Vegetation, disturbance, and successional pathways. On the frequently disturbed flood plains and fans, the vegetation is composed of a wide to narrow band of red alder (*Alnus rubra*), Sitka alder (*Alnus sinuata*), and salmonberry (*Rubus spectabilis*). Black cottonwood (*Populus trichocarpa*) occurs in some areas. Highly productive Sitka spruce and western hemlock forests dominate the raised alluvial terraces above the yearly flood plain communities and the uplifted beaches and rock headlands. Disturbance maintains Sitka spruce as the dominant of most stands within this LTA. Infrequently disturbed alluvial terraces and colluvial slopes may have mixed conifer forest, tall shrub communities (e.g., Sitka willow [*Salix sitchensis*]), or nonforested wetlands.

Lowland Wetland-Forest Complex

Geomorphic Setting. Wide areas of forested and nonforested peatlands occur on compact till and glaciomarine silt deposits on flat to gently sloping areas. The soils are organic and deep to moderately deep with inclusions of better drained mineral soil throughout.

Hydrologic function. Water primarily enters the system from precipitation. Water moves slowly across these wetlands except during large storm events when the whole organic mat becomes saturated and sheet flow occurs. These wetlands are important in water retention for flood control. This LTA is primarily a donor of water to other landscapes. Some groundwater-fed wetlands are inclusions in this LTA, and they are both receptors and donors. Because of the fine-grained substrate and low gradient, this landscape is a prime location for *Sphagnum* growth.

Vegetation, disturbance, and successional pathways. Bogs (muskegs) are common, where peat moss (*Sphagnum* spp.) and sedge peat has accumulated and filled in small depressions and flats. They are primarily dominated by shorepine/sedge (*Pinus contorta*/*Carex* spp.) and tufted clubrush/peatmoss (*Scirpus caespitosum*/*Sphagnum*) community types. Where drainage is better, as along small stream channels, a shore pine or mixed conifer forested wetland occurs. Rich fens occur in this LTA where waters are calcium-rich, because of limestone bedrock, such as in the lower Indian River watershed.

Estuaries/Beaches

Geomorphic setting. These areas are directly influenced by tidal action (daily or yearly basis), such as supratidal meadows and intertidal flats. Riverine sands and silts are accumulated and reworked by tidal action. The extent of these deposits is highly influenced by the size of the inlet or bay, and tidal action. Many of these areas are not within the Analysis Area, since National Forest jurisdiction does not apply to lands below the mean high tide line.

Hydrologic function. The fine-grained substrates are deep and poorly drained. This LTA is a receptor of water from upslope and from saltwater. Along sloughs or small incised stream channels, drainage is better. Fine sand and silt limit water movement through the soil. Sea water inundates areas during large storms.

Vegetation and successional pathways. On the upper tidal flats, lyngbyei sedge (*Carex lyngbyei*), alkali grass (*Puccinellia* spp.), and other salt tolerant species dominate. Adjacent to estuaries, in the supratidal meadows, bluejoint (*Calamagrostis canadensis*), cow parsnip (*Heracleum lanatum*), and Sitka sedge (*Carex sitchensis*) are common species.

Plant Species Diversity

For the Northeast Chichagof Landscape Analysis Area, seven tree species are known (Chatham Area IRI/ECO database 1997; M. Shephard, pers. comm. 1997):

- western and mountain hemlock
- yellowcedar
- Sitka spruce
- shore pine
- black cottonwood
- red alder

Twenty-nine shrub species, 106 forbs, 29 graminoids, 19 ferns/fern allies, and sphagnum moss have been observed during sampling of 39 vegetation plots, 16 sensitive plant surveys, and four fen surveys in the analysis area conducted in the 1980s and 1990s (Chatham Area IRI/ECO database 1997; Indian River Sensitive Plant Survey database 1997).

It is likely that additional species would be found with additional sampling, particularly in non-forest areas, since over half of the existing sampling was conducted in forested areas. Other than sphagnum moss, no moss sampling has been conducted. Worley (1972) reports 572 species and varieties of bryophytes for southeast Alaska: 159 hepatics (liverworts) and 413 mosses. Some portion of these occur in the analysis area. Lichen sampling conducted at Pavlov River, near the analysis area, found 30 species in a shore pine/crowberry plot (Geiser et al. 1994). Many of these probably occur in the analysis area. No sampling for fungi or algae has occurred.

Because individual species tallies are difficult to conduct in a large area, we do not have data to support a complete listing of species for the analysis area or for the larger northeast Chichagof area. Those species that may be at risk are discussed in the Threatened, Endangered, and Sensitive Species Sections of this EIS.

Number of species varies by community type, with the greater number generally found in the more open overstory types. In order to conserve this biodiversity, since we cannot tally individual species, we revert to the coarse filter approach and attempt to conserve a diversity of habitats. For more information on species and plant communities on the Chatham Area, refer to Martin et al. (1995).

List of Common Plant Names

Common Name	Scientific Name
Alaska moss heather	<i>Cassiope stelleriana</i>
Aster	<i>Aster modestus</i>
Bent-leaf angelica	<i>Angelica genuflexa</i>
Blueberry	<i>Vaccinium ovalifolium</i> , <i>V. alaskaense</i>
Bluejoint	<i>Calamagrostis canadensis</i>
Copperbush	<i>Cladothamnus pyrolaeiflorus</i>
Cow parsnip	<i>Heracleum lanatum</i>
Crabapple	<i>Malus fusca</i>
Crowberry	<i>Empetrum nigrum</i>
Devil's club	<i>Oplopanax horridum</i>
False hellebore	<i>Veratrum viride</i>
Hairgrass	<i>Deschampsia caespitosa</i>
Horsetail	<i>Equisetum arvense</i>
Lady fern	<i>Athyrium filix-femina</i>
Merten's mountain-heather	<i>Cassiope mertensiana</i>
Mountain hemlock	<i>Tsuga mertensiana</i>
Nagoonberry	<i>Rubus arcticus stellatus</i>
Oak fern	<i>Gymnocarpium dryopteris</i>
Pacific red elderberry	<i>Sambucus racemosa</i>
Peatmoss	<i>Sphagnum</i> species
Red Alder	<i>Alnus rubra</i>
Salmonberry	<i>Rubus spectabilis</i>
Shield fern	<i>Dryopteris austriaca</i>
Shooting star	<i>Dodecatheon jeffreyi</i>
Shore pine	<i>Pinus contorta</i>
Sitka alder	<i>Alnus sinuata</i>
Sitka sedge	<i>Carex sitchensis</i>
Sitka spruce	<i>Picea sitchensis</i>
Sitka willow	<i>Salix sitchensis</i>
Skunk cabbage	<i>Lysichitum americanum</i>
Stink currant	<i>Ribes bracteosum</i>
Swertia	<i>Swertia perennis</i>
Tufted clubrush	<i>Scirpus caespitosum</i>
Western hemlock	<i>Tsuga heterophylla</i>
Yarrow	<i>Achillea borealis</i>
Yellow cedar	<i>Chamaecyparis nootkatensis</i>

Appendix I

Road Cards

Appendix I

2000 Census

Indian River Timber Sale(s)
Road Cards

The road cards provide a summary of information about individual proposed or existing roads which are included in one or more alternatives. They display site-specific information such as additional mitigation measures, observations, and need for further assistance during field layout.

INDIAN RIVER ROAD CARD

ROAD NUMBER: 7500 (PAGE 1)

VCU: 2200

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE NEEDED	APPROVED BY: S.TRULL
REMARKS: No concerns.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Consult with fish biologist if existing bridges are replaced with something other than bridge. * Consult road survey (1995) information and watershed analysis for entire 7500 road. Design and implement reconstruction as per BMPs 14.4 (LTF), 14.6, 14.8, 14.9, 14.14, 14.17.		
{ HERITAGE }	FIELD REVIEW: IN PROGRESS	APPROVED BY: K.IWAMOTO
REMARKS: High probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: One alluvial fan crossing; consult with hydrologist on structure size and position.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Road is located on lower edge of carbonate rock boundary, passing through small areas of low, moderate, and high vulnerability karst, as well as non-carbonated rock areas. Maintain water quality, free flow of water.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: G.VIRTUE	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns. Involve LA during site selection, design, and implementation of LTF.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs		

INDIAN RIVER PROJECT ROAD CARD

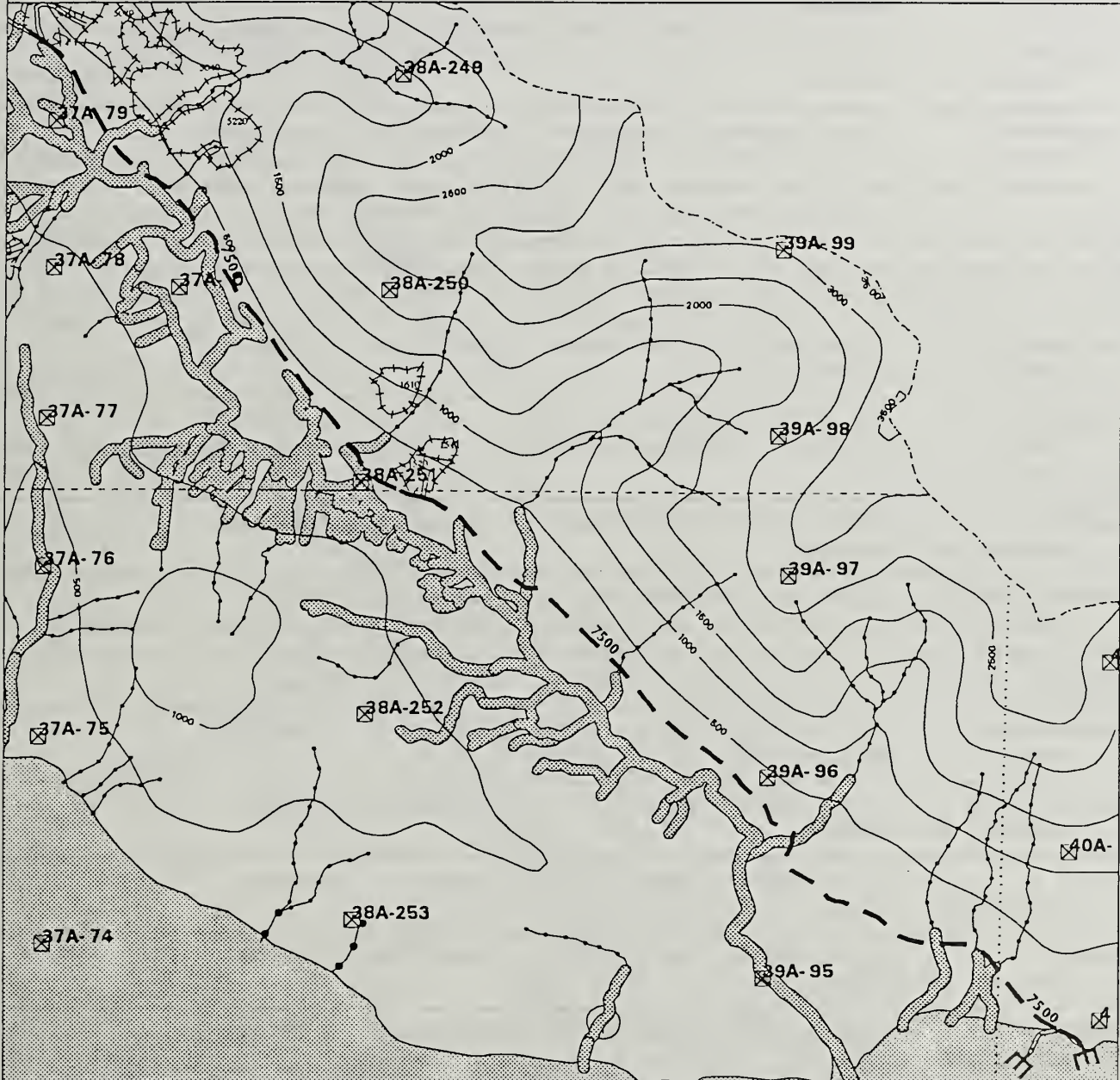
PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 7500 Page 1

QUAD(S): SITD4SW, SITD4SE

VCU(S): 2200, 2201

ALTERNATIVE		B	C	D	E	F
Subject Road Existing		5.59	5.49	0.00	5.59	5.49
Subject Road Planned		0.00	0.00	0.00	0.00	0.00
Total Miles		5.59	5.49	0.00	5.59	5.49



LEGEND:

UNIT BOUNDARY
SUBJECT ROAD EXIST 750001
SUBJECT ROAD PLAN 750001
OTHER EXISTING ROAD
OTHER PLANNED ROAD
TEMPORARY ROAD
CLASS III STREAM
CLASS II STREAM

LOG TRANSFER FACILITY

QUAD line

4270

500 FT CONTOUR INTERVAL

0 0.63 1.26 Miles

Map Scale 1:40000

EAGLE TREE

PHOTO POINT

VCU line

TTRA BUFFERS

SALTWATER & LAKES

AREA LOCATOR



INDIAN RIVER ROAD CARD

ROAD NUMBER: 7500 (page 2)

VCU: 2200

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE NEEDED	APPROVED BY: S.TRULL REMARKS: No concerns.
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY REMARKS: No concerns.
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER REMARKS: Consult with fish biologist when designing road reconstruction. Road has six washout sites, mostly at alluvial fan crossings (see hydrology remarks), and nine culverts (6 are barriers to fish passage) impacted by beaver activity in fen areas within the upper ¼ of the IR watershed. In fen/wetland areas associated with beaver, design drainage as per BMP 14.17. Replace 60x84 inch squash pipe (major barrier to class I, mm2 channel) near upper end of road with bridge. BMPs 14.6, 14.8, 14.9, 14.14.
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER REMARKS: Five alluvial fan crossings. Consult with hydrologist on structure size and position.
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER REMARKS: Road is located on lower edge of carbonate rock boundary, passing through small areas of low, moderate, and high vulnerability karst, as well as non-carbonated rock areas. Maintain water quality, free flow of water.
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL REMARKS: No concerns.
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN REMARKS: No concerns.
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN REMARKS: No concerns.
{ TRANSPORTATION }	FIELD REVIEW: G.VIRTUE	APPROVED BY: B.CRIDER REMARKS: No concerns.
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY REMARKS: Possible goshawk nest, segment 302. Survey for goshawks as funding allows. Follow S&Gs if active nest is located. Follow RMOs.

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 7500 Page 2

QUAD(S): SITD4NW, SITD4SW

VCU(S): 2160, 2200

ALTERNATIVE		B	C	D	E	F
Subject Road Existing		5.53	5.53	1.52	5.53	5.53
Subject Road Planned		0.00	0.00	0.00	0.00	0.00
Total Miles		5.53	5.53	1.52	5.53	5.53



LEGEND:

UNIT BOUNDARY
 SUBJECT ROAD EXIST 750002
 SUBJECT ROAD PLAN 750002
 OTHER EXISTING ROAD
 OTHER PLANNED ROAD
 TEMPORARY ROAD
 CLASS III STREAM
 CLASS II STREAM

LOG TRANSFER FACILITY

QUAD line

4270

500 FT CONTOUR INTERVAL

0 0.71 1.42 Miles

Map Scale 1:45000

EAGLE TREE

PHOTO POINT

VCU line

TTRA BUFFERS

SALTWATER & LAKES

AREA LOCATOR



INDIAN RIVER ROAD CARD

ROAD NUMBER: 7500 (page 3)

VCU: 2200

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.DALTON	APPROVED BY: S.TRULL
REMARKS: Open forest/muskeg habitat; no sensitive plants found in survey of segment 5.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Consult with fish biologist/hydrologist when designing road reconstruction. Also consult road survey information (1995) and watershed analysis for entire South Fork of Freshwater Road. Existing road has 3 culverts that are fish barriers and another barrier where no structure was placed in a small stream in a fen-wetland area. Four washouts are present where alluvial fan (AF) channels cross the road. The upper NW end of the new road passes through several wetland-fen areas and crosses numerous small class I and II fish streams. Design and implement as per BMPs 14.2, 14.3, 14.6, 14.7-9, 14.12, 14.14, 14.17. See hydrology remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Five alluvial fan crossings. Consult with hydrologist on structure size and position, and during design and layout of segments 3, 6, 13, 22, and 27.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: G.VIRTUE	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 7500 Page 3

QUAD(S): SITD5NE, SITD4NW

VCU(S): 2041, 2160

	ALTERNATIVE	B	C	D	E	F
Subject Road Existing		3.45	3.45	3.45	3.45	3.45
Subject Road Planned		1.73	2.21	2.21	1.73	2.21
=====	=====	=====	=====	=====	=====	=====
Total Miles		5.18	5.66	5.66	5.18	5.66



LEGEND:

UNIT BOUNDARY
 SUBJECT ROAD EXIST 750003
 SUBJECT ROAD PLAN 750003
 OTHER EXISTING ROAD
 OTHER PLANNED ROAD
 TEMPORARY ROAD
 CLASS III STREAM
 CLASS II STREAM
 LOG TRANSFER FACILITY
 QUAD line

500 FT CONTOUR INTERVAL

0 0.63 1.26 Miles

Map Scale 1:40000

EAGLE TREE

PHOTO POINT

VCU line

TTRA BUFFERS

SALTWATER & LAKES

AREA LOCATOR



INDIAN RIVER ROAD CARD

ROAD NUMBER: 75002

VCU: 2200

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS:		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS:		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS:		
{ HERITAGE }	FIELD REVIEW: K.BROWN	APPROVED BY: K.IWAMOTO
REMARKS:	Approximately 200' of East Tenakee Trail would be relocated in Alternative F.	
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS:		
{ LANDS }	FIELD REVIEW:	APPROVED BY: J.MORRELL
REMARKS:	Relocation of East Tenakee Trail in Alternative F will require approval by the State of Alaska, Department of Natural Resources.	
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS:		
{ RECREATION }	FIELD REVIEW: NONE	APPROVED BY: M.NELSON
REMARKS:	Construction will disrupt use on East Tenakee Trail. See Appendix C, Recreation mitigation measures.	
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS:	No concerns.	
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS:		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS:		
{ TRANSPORTATION }	FIELD REVIEW: B.CRIDER	APPROVED BY: J.COSTA
REMARKS:		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS:		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS:		

INDIAN RIVER PROJECT ROAD CARD

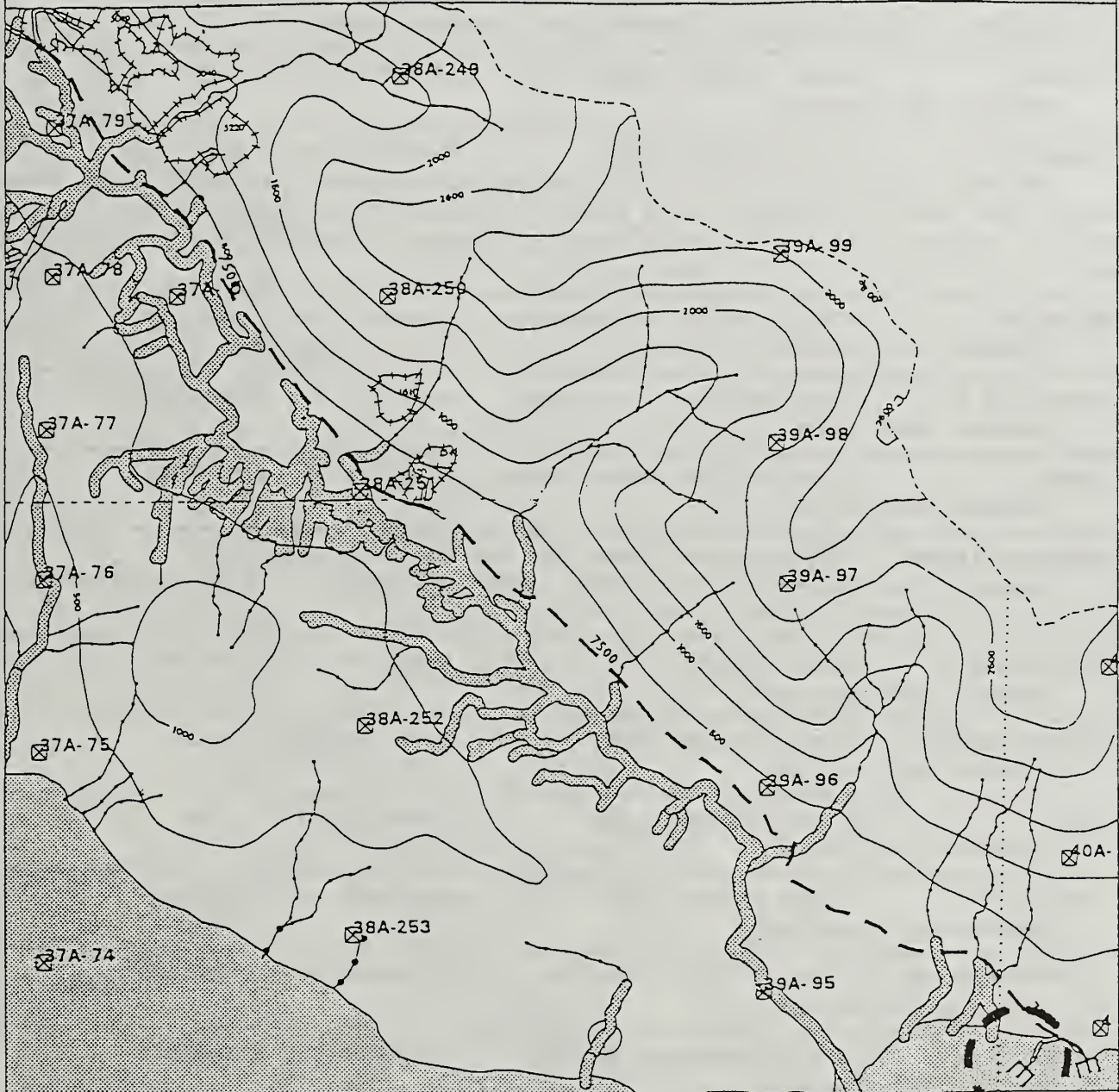
PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 75002

QUAD(S): SITD4SW, SITD4SE

VCU(S): 2200

	ALTERNATIVE	B	C	D	E	P
Subject Road Existing		0.00	0.00	0.00	0.00	0.00
Subject Road Planned		0.00	0.00	0.00	0.00	0.15
=====		0.00	0.00	0.00	0.00	0.15
Total Miles		0.00	0.00	0.00	0.00	0.15



LEGEND:

UNIT BOUNDARY
SUBJECT ROAD EXIST 750001
SUBJECT ROAD PLAN 750001
OTHER EXISTING ROAD
OTHER PLANNED ROAD
TEMPORARY ROAD
CLASS III STREAM
CLASS II STREAM

LOO TRANSFER FACILITY

QUAD line

4770

500 FT CONTOUR INTERVAL

0 0.63 1.26 Miles

Map Scale 1:40000

EAGLE TREE

PHOTO POINT

VCU line

TTRA BUFFERS

SALTWATER & LAKES

AREA LOCATOR

4770

500 FT CONTOUR INTERVAL

0 0.63 1.26 Miles

Map Scale 1:40000

EAGLE TREE

PHOTO POINT

VCU line

TTRA BUFFERS

SALTWATER & LAKES

AREA LOCATOR

INDIAN RIVER ROAD CARD

ROAD NUMBER: 75003

VCU: 2200

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: Consult with fish biologist/hydrologist when designing road. Road crosses near upstream boundary of 4 class II fish streams; crosses about 10 small class III streams; and a relatively large HC6 channel. Design and implement as per BMPs 14.2; 14.3; 14.6; 14.9; 14.12; 14.17.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: Note BMPs 14.5; 14.7; 14.8; 14.9		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Road passes through small areas of moderate to high vulnerability. Maintain water quality, free flow of water.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: G.VIRTUE	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 75003

QUAD(S): SITD4SW

VCU(S): 2200

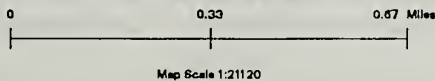
	ALTERNATIVE	B	C	D	E	F
Subject Road Existing		0.13	0.00	0.00	0.00	0.13
Subject Road Planned		0.54	0.00	0.00	0.00	0.54
=====	=====	=====	=====	=====	=====	=====
Total Miles		0.67	0.00	0.00	0.00	0.67



LEGEND:

- UNIT BOUNDARY
- SUBJECT ROAD EXIST 75003
- SUBJECT ROAD PLAN 75003
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

500 FT CONTOUR INTERVAL



AREA LOCATOR

- EAGLE TREE
- PHOTO POINT
- VCU line
- TTRA BUFFERS
- SALTWATER & LAKES



INDIAN RIVER ROAD CARD

ROAD NUMBER: 75004

VCU: 2200

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: Consult with hydrologist/fish biologist during final location and when designing road. Reconstruction segment of road crosses main channel, class I MM2 fish stream and several small class I/II palustrine (PAO) and/or footslope (FSO) streams. Protect streams as per BMPs 14.6; 14.9; 14.14; 14.17. New construction segment crosses about 8 small class III footslope (FSO) channels. Protect as per BMPs 14.2; 14.3; 14.9; 14.12; 14.17.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Implement BMPs. One MM2 channel crossing; consult with hydrologist on structure sizing.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Intersection of road is located on small area of high vulnerability karst. Maintain water quality, free flow of water.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: Full bench and endhaul in portions of segments 372, 376. Consult with soil scientist during final location (segments 372, 377, 378).		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: G.VIRTUE	APPROVED BY: B.CRIDER
REMARKS: Recommend full bench and end haul, segment 372. Difficult grade and switchback in segment 378.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

ROUTE NUMBER: 75004		QUAD(S): SITD4SW				
		VCU(S): 2200				
ALTERNATIVE		B	C	D	E	F
Subject Road Existing		0.60	0.60	0.00	0.60	0.60
Subject Road Planned		0.56	0.56	0.00	0.56	0.56
Total Miles		1.15	1.15	0.00	1.15	1.15

LEGEND:

- UNIT BOUNDARY
- SUBJECT ROAD EXIST 75004
- SUBJECT ROAD PLAN 75004
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

500 FT CONTOUR INTERVAL

0 0.33 0.67 Miles

Map Scale 1:21120

AREA LOCATOR

EAGLE TREE

PHOTO POINT

VCU line

TTRA BUFFERS

SALTWATER & LAKES

INDIAN RIVER ROAD CARD

ROAD NUMBER: 75007

VCU: 2160

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.DALTON M. SHEPHARD	APPROVED BY: S.TRULL
REMARKS: Sensitive plants found in 1995 and 1996 surveys of segments 115 and 121. Recommend moving road uphill 150 feet minimum from road line flagged in field (as of 7/96). Recommend botanist accompany road locators.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Consult hydrologist/fish biologist when designing road. Road crosses at least three relatively high power HC2 or HC3 streams, as well as at least 4 smaller FSO (footslope) streams. The road crosses a number of these right at the boundary between class II and class III habitat. Design crossings as per BMPs 14.2; 14.3; 14.6; 14.7; 14.9; 14.12; 14.14; 14.17.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: B.CRIDER	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

INDIAN RIVER PROJECT ROAD CARD

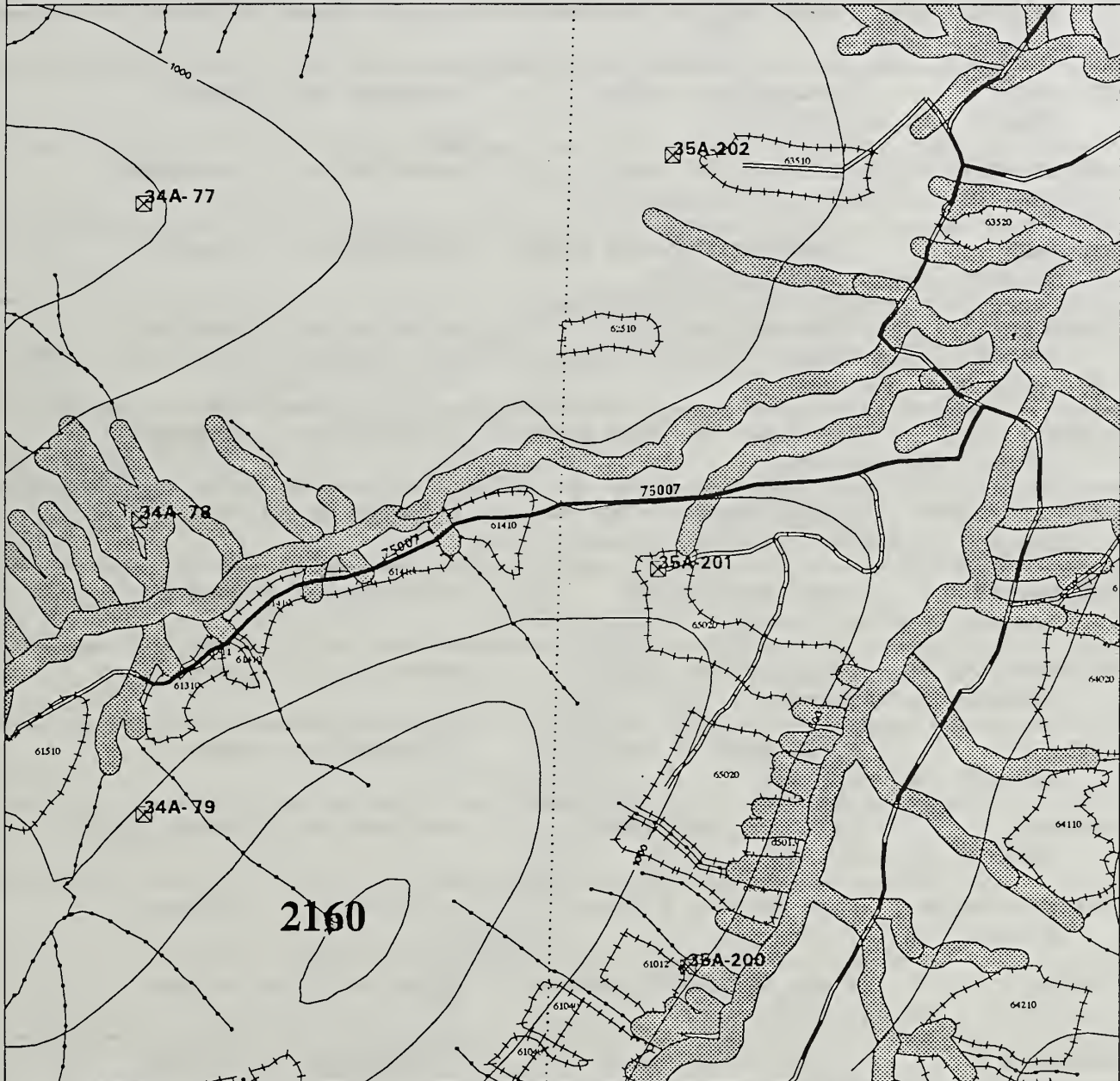
PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 75007

QUAD(S): SITD4NW, SITD5NE

VCU(S): 2160

ALTERNATIVE		B	C	D	E	F
Subject Road Existing		0.00	0.00	0.00	0.00	0.00
Subject Road Planned		1.76	1.82	1.82	1.82	1.82
Total Miles		1.76	1.82	1.82	1.82	1.82



LEGEND:

UNIT BOUNDARY
SUBJECT ROAD EXIST 75007
SUBJECT ROAD PLAN 75007
OTHER EXISTING ROAD
OTHER PLANNED ROAD
TEMPORARY ROAD
CLASS III STREAM
CLASS II STREAM
LOG TRANSFER FACILITY
QUAD line



500 FT CONTOUR INTERVAL

0 0.33 0.67 Miles

Map Scale 1:21120

EAGLE TREE
PHOTO POINT
VCU line



TTRA BUFFERS
SALTWATER & LAKES



AREA LOCATOR



INDIAN RIVER ROAD CARD

ROAD NUMBER: 750071

VCU: 2160

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.DALTON	APPROVED BY: S.TRULL
REMARKS: Open forest habitat; no sensitive plants found on survey of segment 168.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: see hydrology remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Road crosses several small hillslope streams. Design as per BMPs 14.5; 14.7; 14.8; 14.9.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: B.CRIDER	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 750071

QUAD(S): SITD4NW

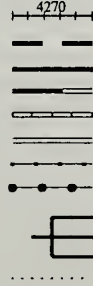
VCU(S): 2160

ALTERNATIVE		B	C	D	E	F
Subject Road Existing		0.00	0.00	0.00	0.00	0.00
Subject Road Planned		0.00	0.99	0.99	0.99	0.99
Total Miles		0.00	0.99	0.99	0.99	0.99

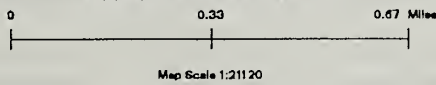


LEGEND:

- UNIT BOUNDARY
- SUBJECT ROAD EXIST 750071
- SUBJECT ROAD PLAN 750071
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line



500 FT CONTOUR INTERVAL



EAGLE TREE

PHOTO POINT

VCU line

TTRA BUFFERS

SALTWATER & LAKES



AREA LOCATOR



INDIAN RIVER ROAD CARD

ROAD NUMBER: 7501

VCU: 2200

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Consult fish biologist/hydrologist when designing road reconstruction and new construction. Also consult road survey (1995) and watershed analysis for site information. The road crosses through a large fen area with several class I palustrine (PA1 and PAO) streams, and crosses at least 3 alluvial fan (AF1) channels (class I and II) and 2 high power, deeply incised HC6 channels. Design as per BMPs 14.2; 14.3; 14.6; 14.8; 14.9; 14.12; 14.14; 14.17.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Two alluvial fan crossings. Consult hydrologist on structure size and position.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: Consult with soil scientist during layout and design.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: B.CRIDER	APPROVED BY: B.CRIDER
REMARKS: Soils review segment 415.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: L.SHIPLEY	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 7501

QUAD(S): SITD4SW

VCU(S): 2200

	ALTERNATIVE	B	C	D	E	F
Subject Road Existing		0.61	0.61	0.00	0.61	0.61
Subject Road Planned		0.94	0.94	0.00	0.94	0.94
=====		=====	=====	=====	=====	=====
Total Miles		1.55	1.55	0.00	1.55	1.55



LEGEND:

- UNIT BOUNDARY
- SUBJECT ROAD EXIST 7501
- SUBJECT ROAD PLAN 7501
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line



500 FT CONTOUR INTERVAL

0 0.33 0.67 Miles

Map Scale 1:21120

- EAGLE TREE
- PHOTO POINT
- VCU line
- TTRA BUFFERS
- SALTWATER & LAKES

AREA LOCATOR



INDIAN RIVER ROAD CARD

ROAD NUMBER: 75012

VCU: 2200

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Consult with fish biologist when designing road reconstruction and new construction. The road crosses at least one class I FPO stream and several smaller palustrine (PAO) channels. Design as per BMPs 14.6; 14.9; 14.17.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: B.CRIDER	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: L.SHIPLEY	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

INDIAN RIVER ROAD CARD

ROAD NUMBER: 7502

VCU: 2160, 2221, 2210

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.DALTON	APPROVED BY: S.TRULL
REMARKS: Beach habitat at proposed LTF. No sensitive plants found in survey of segment 326.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
(Old road only)		
REMARKS: Consult w/ fish biologist when designing reconstruction and new construction. See road survey (1995) & watershed analysis for site information/design/RMO guidance. Existing road has 3 washouts at alluvial fan (AF) channel crossings; several small landslides; and at least 4 failed culverts. The existing road also crosses 15 fish streams. Recommend "oversized" culverts, ditch blocks, and armored dips at existing alluvial fan washouts.		
{ HERITAGE }	FIELD REVIEW: YES	APPROVED BY: K.IWAMOTO
REMARKS: High probability zone. No cultural resources identified at LTF.		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: Implement BMPs. Concerned about V-notch crossing at segment 315. Two alluvial fans; one MM2 crossing. Consult with hydrologist. See soils remarks.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Road is located on some small areas of low, moderate, and high vulnerability karst, as well as non-carbonated rock areas. Maintain water quality, free flow of water.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Severe soils concerns along part of segment 326; recommend deleting. Consult soil scientist/hydrologist during design and layout of segments 298, 315, 320, 326.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: B.CRIDER/G.VIRTUE	APPROVED BY: B.CRIDER
REMARKS: Concern about switchbacks, oversteep slopes, and grade, and need for full bench and end hauling along portions of segment 326. Recommend full bench with end haul along segment 315.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: Concern on segment 326. Involve LA during site selection, design, and implementation of LTF.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 7502

QUAD(S): SITD4NW, SITD5NE, SITD5SE

VCU(S): 2160, 2221, 2210

	ALTERNATIVE	B	C	D	E	F
Subject Road Existing		5.34	5.34	5.34	5.22	5.34
Subject Road Planned		1.71	0.27	1.71	0.00	0.00
Total Miles		7.05	5.62	7.05	5.22	5.34



LEGEND:

UNIT BOUNDARY
SUBJECT ROAD EXIST 7502
SUBJECT ROAD PLAN 7502
OTHER EXISTING ROAD
OTHER PLANNED ROAD
TEMPORARY ROAD
CLASS III STREAM
CLASS II STREAM

LOG TRANSFER FACILITY

QUAD line

4270

500 FT CONTOUR INTERVAL

0 0.95 1.89 Miles

Map Scale 1:80000

EAGLE TREE

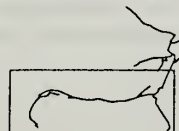
PHOTO POINT

VCU line

TTRA BUFFERS

SALTWATER & LAKES

AREA LOCATOR



INDIAN RIVER ROAD CARD

ROAD NUMBER: 75021

VCU: 2160

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: See hydrology remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: Consult hydrologist when designing road. This proposed road crosses a large class I, mm2 channel, a high power HC6 channel and more than 10 small class III hillslope streams. Design as per BMPs 14.5; 14.6; 14.7; 14.8; 14.9; 14.12; 14.17.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: G.VIRTUE	APPROVED BY: B.CRIDER
REMARKS: Recommend spec status.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 75021

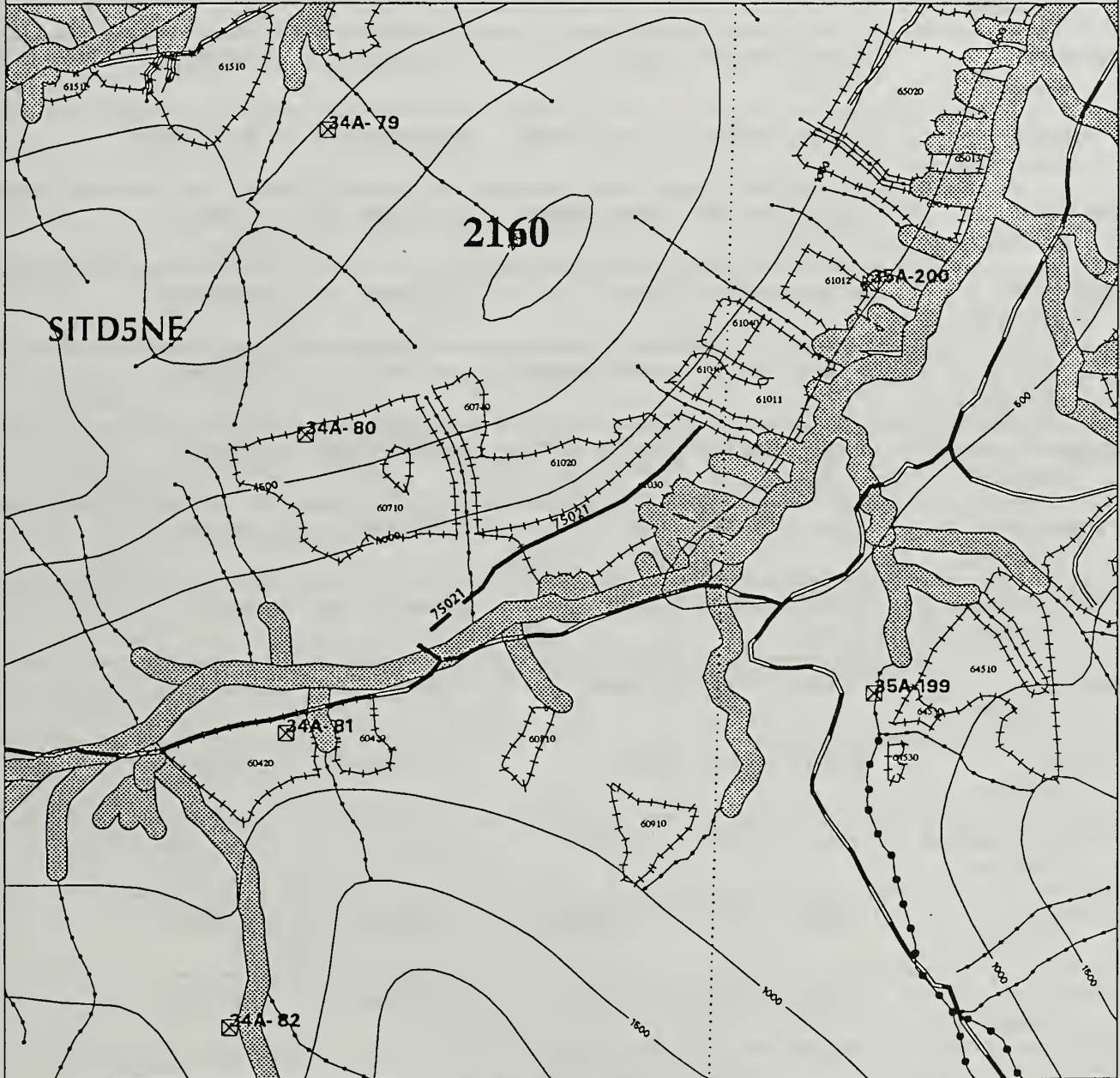
QUAD(S):

SITD5NE

VCU(S):

2160

ALTERNATIVE		B	C	D	E	F
Subject Road Existing		0.22	0.22	0.22	0.22	0.22
Subject Road Planned		0.54	0.54	0.54	0.54	0.54
Total Miles		0.76	0.76	0.76	0.76	0.76



LEGEND:

- UNIT BOUNDARY
- SUBJECT ROAD EXIST 75021
- SUBJECT ROAD PLAN 75021
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

500 FT CONTOUR INTERVAL

0 0.33 0.67 Miles

Map Scale 1:21120

EAGLE TREE

PHOTO POINT

VCU line

TTRA BUFFERS

SALTWATER & LAKES

AREA LOCATOR



INDIAN RIVER ROAD CARD

ROAD NUMBER: 75023

VCU: 2221

REVIEW INFORMATION		
{ BOTANY } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
{ ECOLOGY } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
{ FISHERIES } REMARKS:	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
{ HERITAGE } REMARKS:	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
{ HYDROLOGY } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
{ LANDS } REMARKS:	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
{ MINERALS/KARST } REMARKS:	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
{ RECREATION } REMARKS:	FIELD REVIEW: YES	APPROVED BY: M.NELSON
{ SILVICULTURE } REMARKS: No concerns.	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
{ SOILS } REMARKS:	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
{ TIMBER } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
{ TRANSPORTATION } REMARKS:	FIELD REVIEW: B.CRIDER	APPROVED BY: B.CRIDER
{ VISUAL } REMARKS:	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
{ WILDLIFE } REMARKS:	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 75023

QUAD(S): SITD5NE

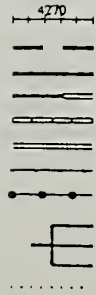
VCU(S): 2221

	ALTERNATIVE	B	C	D	E	F
Subject Road Existing		0	0	0	0.21	0.21
Subject Road Planned		0	0	0	0.00	0.00
=====						
Total Miles		0	0	0	0.21	0.21



LEGEND

UNIT BOUNDARY
 SUBJECT ROAD EXIST 7502
 SUBJECT ROAD PLAN 7502
 OTHER EXISTING ROAD
 OTHER PLANNED ROAD
 TEMPORARY ROAD
 CLASS III STREAM
 CLASS II STREAM
 LOG TRANSFER FACILITY
 QUAD line



EAGLE TREE

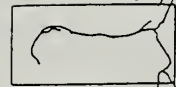
PHOTO POINT

VCU line

TTRA BUFFERS

SALTWATER & LAKES

AREA LOCATOR



INDIAN RIVER ROAD CARD

ROAD NUMBER: 75028

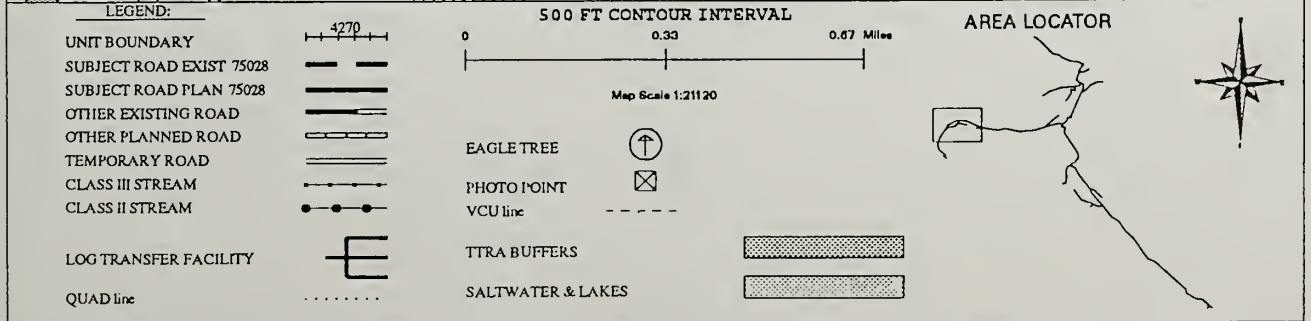
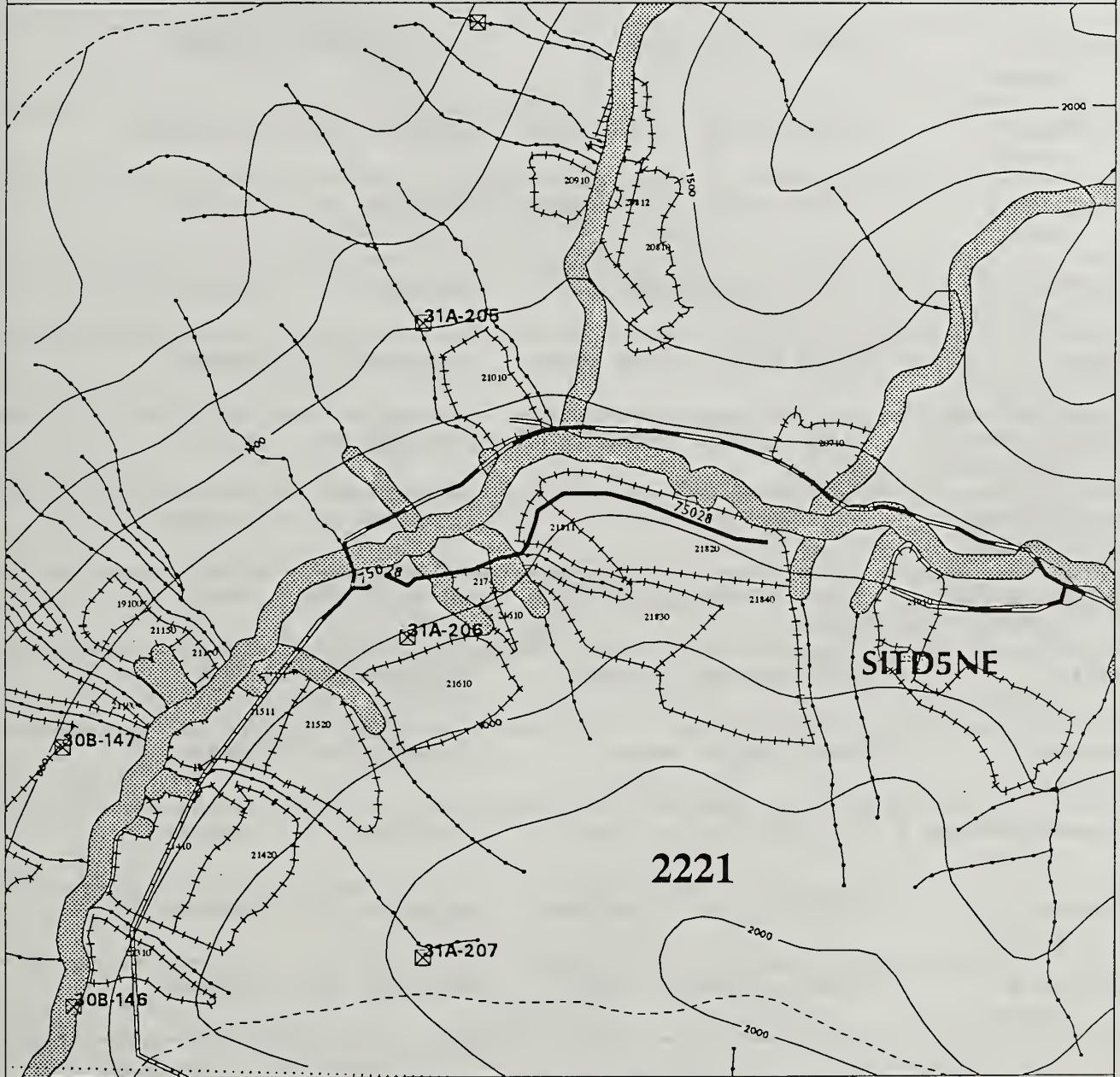
VCU: 2221

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: Consult with hydrologist/fish biologist when designing road. Short road crosses a small class II footslope stream (MM0), a higher power class II, HC2 channel and several smaller footslope streams. Design and implement as per BMPs 14.6; 14.8; 14.9; 14.12; 14.17.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: BMP 14.17. See soils remarks.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Road is located on areas of moderate and high vulnerability karst. Maintain water quality, free flow of water.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: Consult soil scientist/hydrologist during design and layout of segments 205 and 222. See transportation recommendations.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: G.VIRTUE	APPROVED BY: B.CRIDER
REMARKS: Recommend spec status. Recommend full bench with end haul on portions of segment 222.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER:		75028		QUAD(S):		SITD5NE	
				VCU(S):		2221	
ALTERNATIVE		B		C		D	
Subject Road Existing		0.12	0.12	0.12	0.12	0.12	0.12
Subject Road Planned		0.00	0.80	0.80	0.80	0.80	0.80
=====		=====	=====	=====	=====	=====	=====
Total Miles		0.12	0.92	0.92	0.92	0.92	0.92



INDIAN RIVER ROAD CARD

ROAD NUMBER: 7507

VCU: 2160

REVIEW INFORMATION		
{ BOTANY } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
{ ECOLOGY } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
{ FISHERIES } REMARKS:	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
{ HERITAGE } REMARKS:	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
{ HYDROLOGY } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
{ LANDS } REMARKS:	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
{ MINERALS/KARST } REMARKS:	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
{ RECREATION } REMARKS:	FIELD REVIEW: YES	APPROVED BY: M.NELSON
{ SILVICULTURE } REMARKS: No concerns.	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
{ SOILS } REMARKS:	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
{ TIMBER } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
{ TRANSPORTATION } REMARKS:	FIELD REVIEW: B.CRIDER	APPROVED BY: B.CRIDER
{ VISUAL } REMARKS:	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
{ WILDLIFE } REMARKS:	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 7507

QUAD(S): SITD5NE, SITD4NW

VCU(S): 2160

ALTERNATIVE		B	C	D	E	F
Subject Road Existing		2.25	1.00	0.00	0.00	0.00
Subject Road Planned		0.00	0.00	0.00	0.00	0.00
Total Miles		2.25	1.00	0.00	0.00	0.00



LEGEND:

- UNIT BOUNDARY
- SUBJECT ROAD EXIST 750003
- SUBJECT ROAD PLAN 750003
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

500 FT CONTOUR INTERVAL

0 0.63 1.26 Miles

Map Scale 1:40000

EAGLE TREE

PHOTO POINT

VCU line

TTRA BUFFERS

SALTWATER & LAKES

AREA LOCATOR



INDIAN RIVER ROAD CARD

ROAD NUMBER: 7508

VCU: 2160

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.DALTON M.SHEPHARD	APPROVED BY: S.TRULL
REMARKS: Open forest/muskeg habitat; sensitive plants found in survey of segment 128. Recommend moving road location slightly from 7/96 field-flagged line. Recommend botanist present with road locators on segment 128.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Consult with fish biologist and hydrologist when designing this road. The road crosses through/by some muskeg and small fen areas. The road crosses a number of smaller footslope and hillslope class II and III channels; a larger class II mml channel, and several deeply incised HC channels. Design and implement as per BMPs 14.2; 14.3; 14.5; 14.6; 14.7; 14.8; 14.9; 14.17.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: BMPs 14.5; 14.7; 14.8; 14.9; 14.17.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: Consult with soil scientist during design.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: G.VIRTUE	APPROVED BY: B.CRIDER
REMARKS: High cost bridge at the Class I stream crossing segment 128. Recommend full bench and end haul along segment 128.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: L.SHIPLEY	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER:		7508		QUAD(S):		SITD4NW	
		VCU(S):		2160			
	ALTERNATIVE	B	C	D	E	F	
Subject	Road Existing	0.00	0.00	0.00	0.00	0.00	
Subject	Road Planned	0.00	1.02	1.02	1.02	1.02	
Total Miles		0.00	1.02	1.02	1.02	1.02	



LEGEND:

- UNIT BOUNDARY
- SUBJECT ROAD EXIST 7508
- SUBJECT ROAD PLAN 7508
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

500 FT CONTOUR INTERVAL

0 0.33 0.67 Miles

Map Scale 1:21120

- EAGLE TREE
- PHOTO POINT
- VCU line
- TTRA BUFFERS
- SALTWATER & LAKES

AREA LOCATOR

INDIAN RIVER ROAD CARD

ROAD NUMBER: 7509

VCU: 2160

REVIEW INFORMATION		
{ BOTANY } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
{ ECOLOGY } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
{ FISHERIES } REMARKS:	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
{ HERITAGE } REMARKS:	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
{ HYDROLOGY } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
{ LANDS } REMARKS:	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
{ MINERALS/KARST } REMARKS:	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
{ RECREATION } REMARKS:	FIELD REVIEW: YES	APPROVED BY: M.NELSON
{ SILVICULTURE } REMARKS: No concerns.	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
{ SOILS } REMARKS:	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
{ TIMBER } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
{ TRANSPORTATION } REMARKS:	FIELD REVIEW: B.CRIDER	APPROVED BY: B.CRIDER
{ VISUAL } REMARKS:	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
{ WILDLIFE } REMARKS:	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 7509

QUAD(S): SITD5NE, SITD4NW

VCU(S): 2160

ALTERNATIVE	B	C	D	E	F
Subject Road Existing	0.42	0.00	0.00	0.00	0.00
Subject Road Planned	0.00	0.00	0.00	0.00	0.00
Total Miles	0.42	0.00	0.00	0.00	0.00



LEGEND

UNIT BOUNDARY
 SUBJECT ROAD EXIST 750003
 SUBJECT ROAD PLAN 750003
 OTHER EXISTING ROAD
 OTHER PLANNED ROAD
 TEMPORARY ROAD
 CLASS III STREAM
 CLASS II STREAM
 LOG TRANSFER FACILITY
 QUAD line



500 FT CONTOUR INTERVAL

0 0.50 1.00 Miles

Map Scale 1:40000

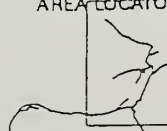
EAGLE TREE
 PHOTO POINT
 VCU line

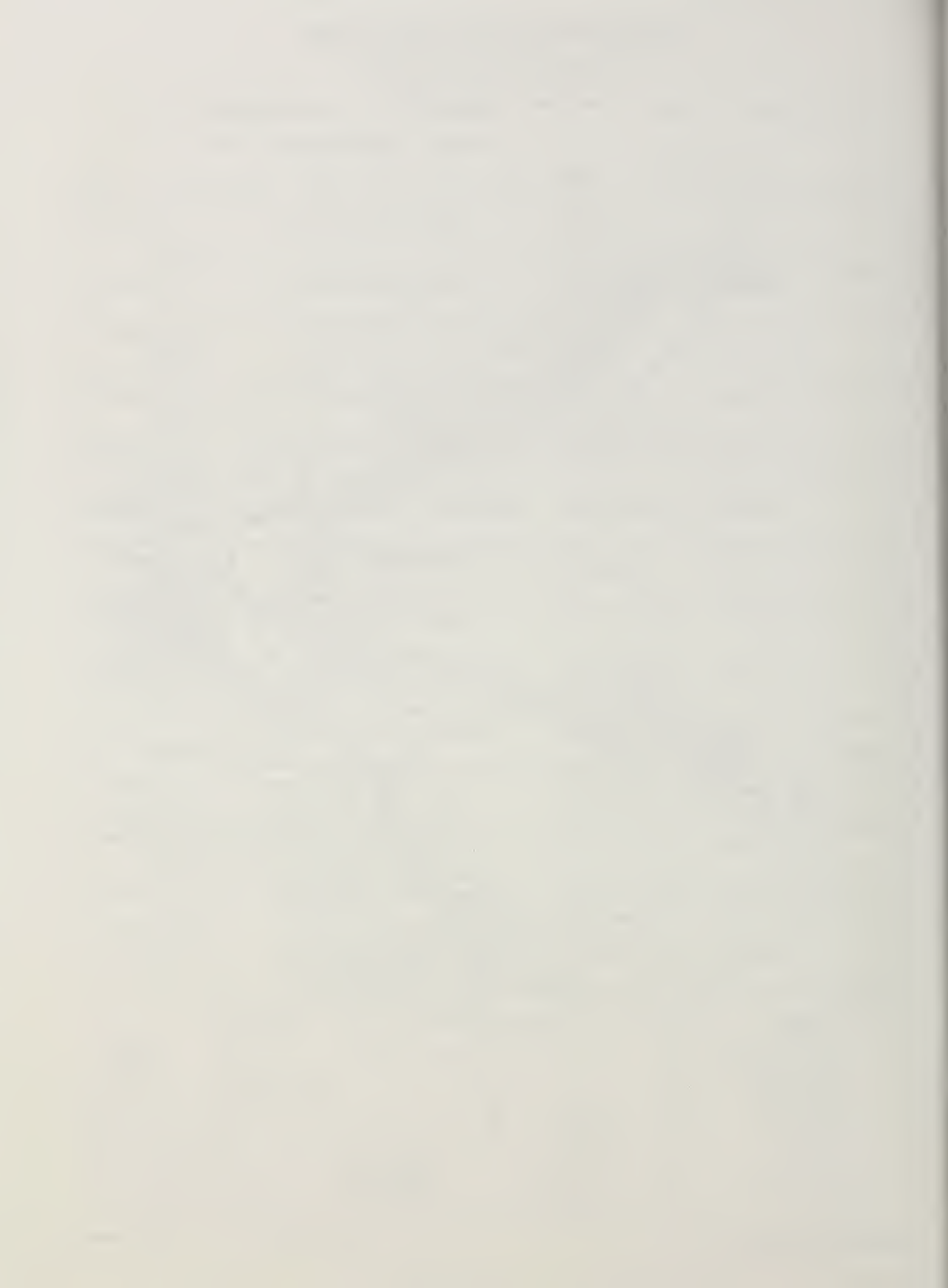


TTRA BUFFERS
 SALTWATER & LAKES



AREA LOCATOR





Appendix J

Unit Cards

ALPHABET

100-1000

Indian River Timber Sale(s) Unit Cards

The unit cards provide a summary of the information about the individual proposed harvest units which are included in one or more alternatives. They portray the site-specific information such as additional mitigation, observations, and where further assistance will be needed during field layout.

The unit cards reflect the desirable condition of the final unit as developed through the interdisciplinary process. They also provide the reviewer with an opportunity to compare the units as they appear in the different alternatives.

Unit cards are used in concert with the silvicultural prescription to aid the field implementation personnel in obtaining the desired objectives as developed by the interdisciplinary team and selected in the Record of Decision.

INDIAN RIVER UNIT CARD

UNIT: 1511
ACRES: 5.3

VCU: 2200
VOLUME (MBF): 148

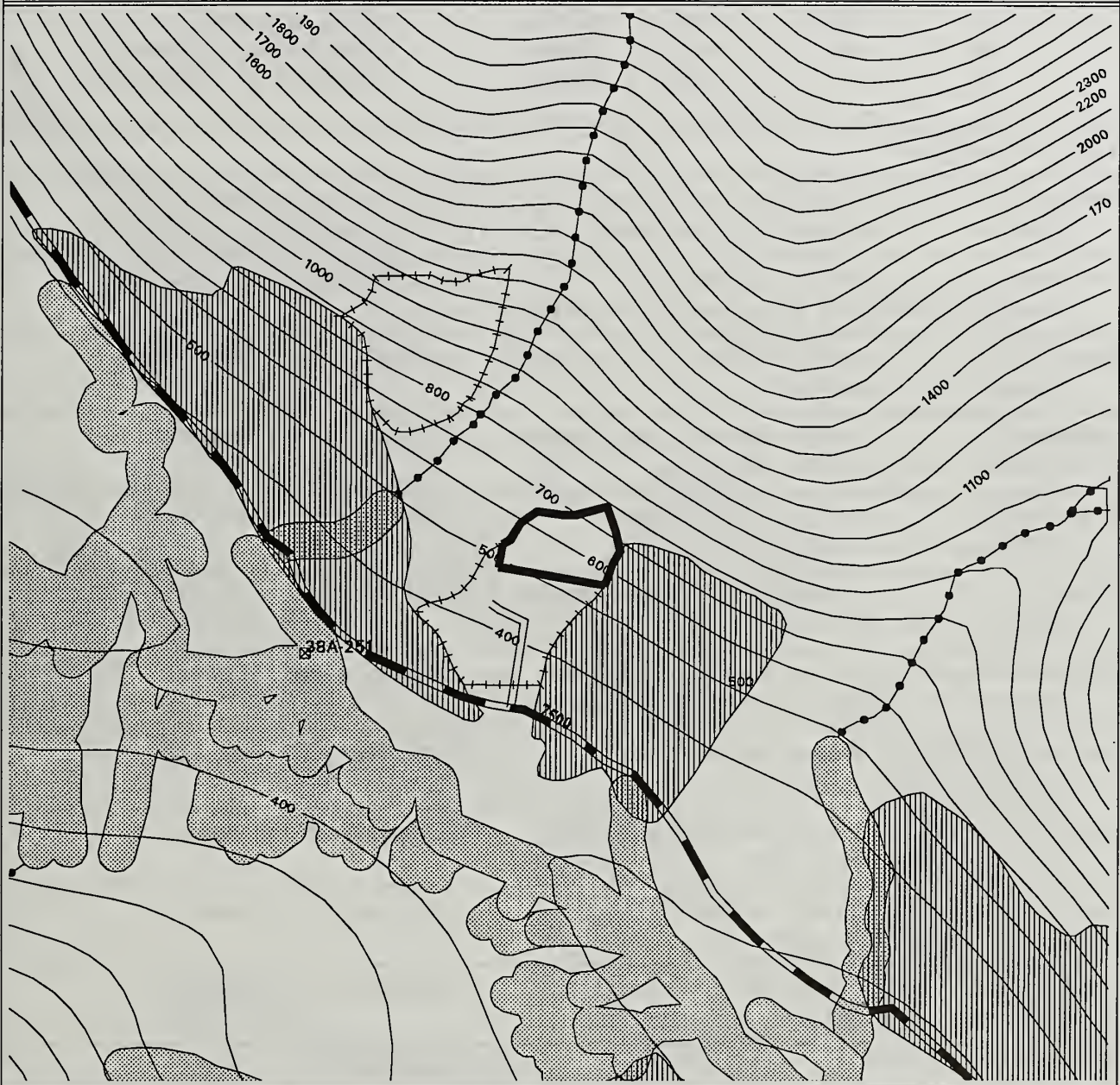
ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	30	Helicopter	Single Tree Selection
E	20	30	Helicopter	Single Tree Selection
F	20	30	Helicopter	Single Tree Selection

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: No concerns.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate. Report any cave features (springs, disappearing streams) to Forest Geologist.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend Single Tree Selection for soil protection.		
{ SOILS }	FIELD REVIEW: F.GLENN	APPROVED BY: J.WINN
REMARKS: Maintain two-thirds root strength to maintain soil stability.		
{ TIMBER }	FIELD REVIEW: B.BEALL	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Buffers and unharvested areas provide suitable travel corridors.		

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 1511 QUAD(s): SITD4SW
ACRES: 5 Unit 1511 Occurs in Alternatives: B E F



100 FT CONTOUR INTERVAL

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



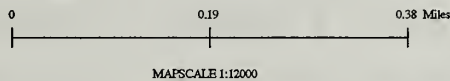
EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 1520 VCU: 2200
ACRES: 10.9 VOLUME (MBF): 310

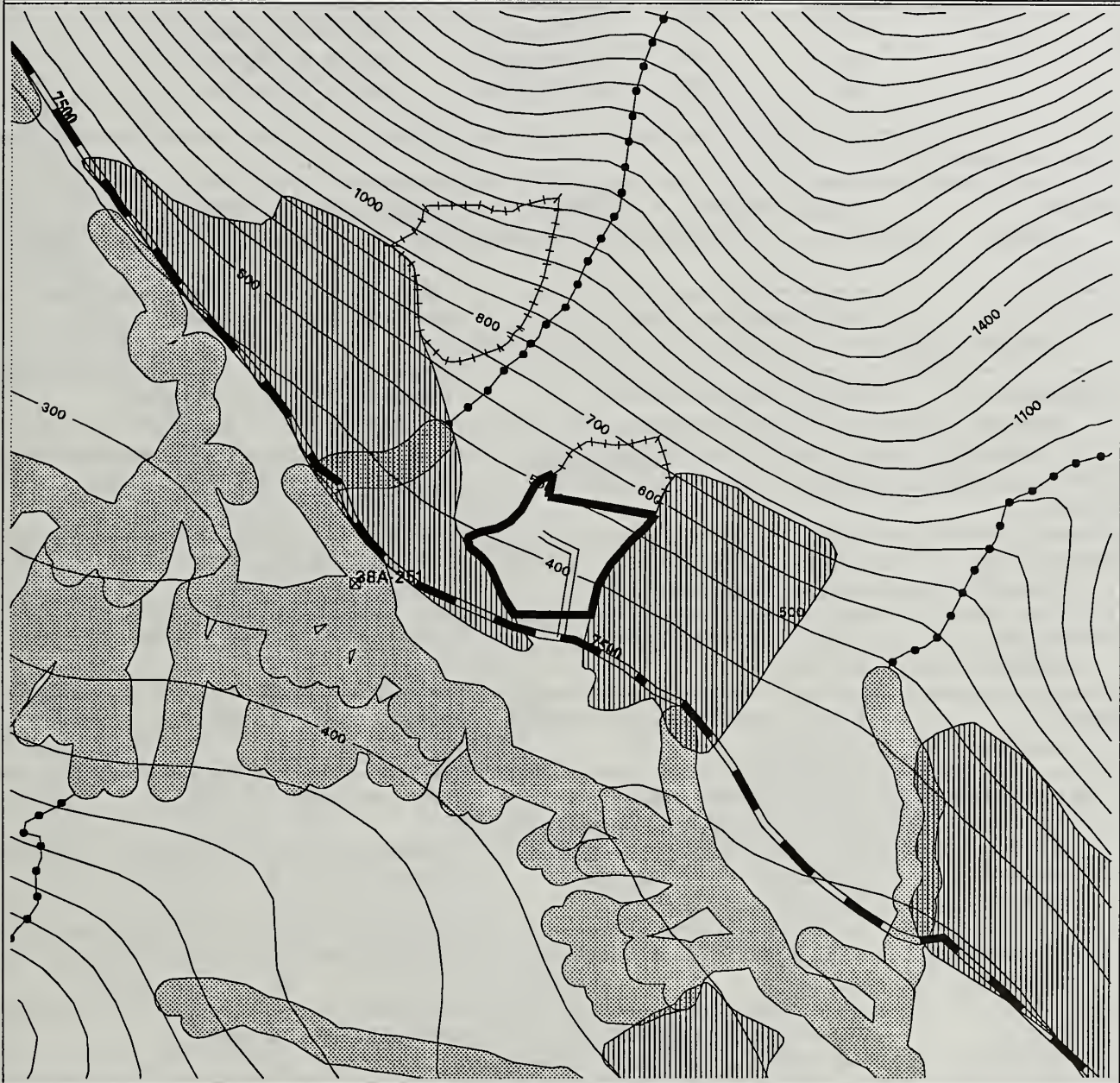
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	62	Shovel	Group Selection
E	90	279	Shovel	Clearcut w/ retention
F	90	279	Shovel	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: No concerns.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Low.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: F.GLENN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: B.BEALL	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: Buffers and unharvested areas provide suitable travel corridors. When using clearcut with retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 1520 QUAD(s): SITD4SW
 ACRES: 11 Unit 1520 Occurs in Alternatives: B E F



100 FT CONTOUR INTERVAL

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 1610
ACRES: 14.2

VCU: 2200
VOLUME (MBF): 193

		ALTERNATIVE SUMMARY		
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	96	Helicopter	Overstory Removal
E	35	68	Helicopter	Patch Clearcut
F	35	68	Helicopter	Patch Clearcut

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.SHEPHARD	APPROVED BY: S.TRULL
REMARKS: Significant alpine/subalpine Habitat. No sensitive plants found in survey.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: Leave windfirm boundary on class III HC6 channel (category B) on SE. If possible, recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on southwest side of unit.		
{ TIMBER }	FIELD REVIEW: B.BEALL	APPROVED BY: M.REGAN
REMARKS: Helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: Alt. B does not meet VQO. LA to assist in unit layout. Alt. E and F meet VQO.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: Red-tail hawk sighted.		

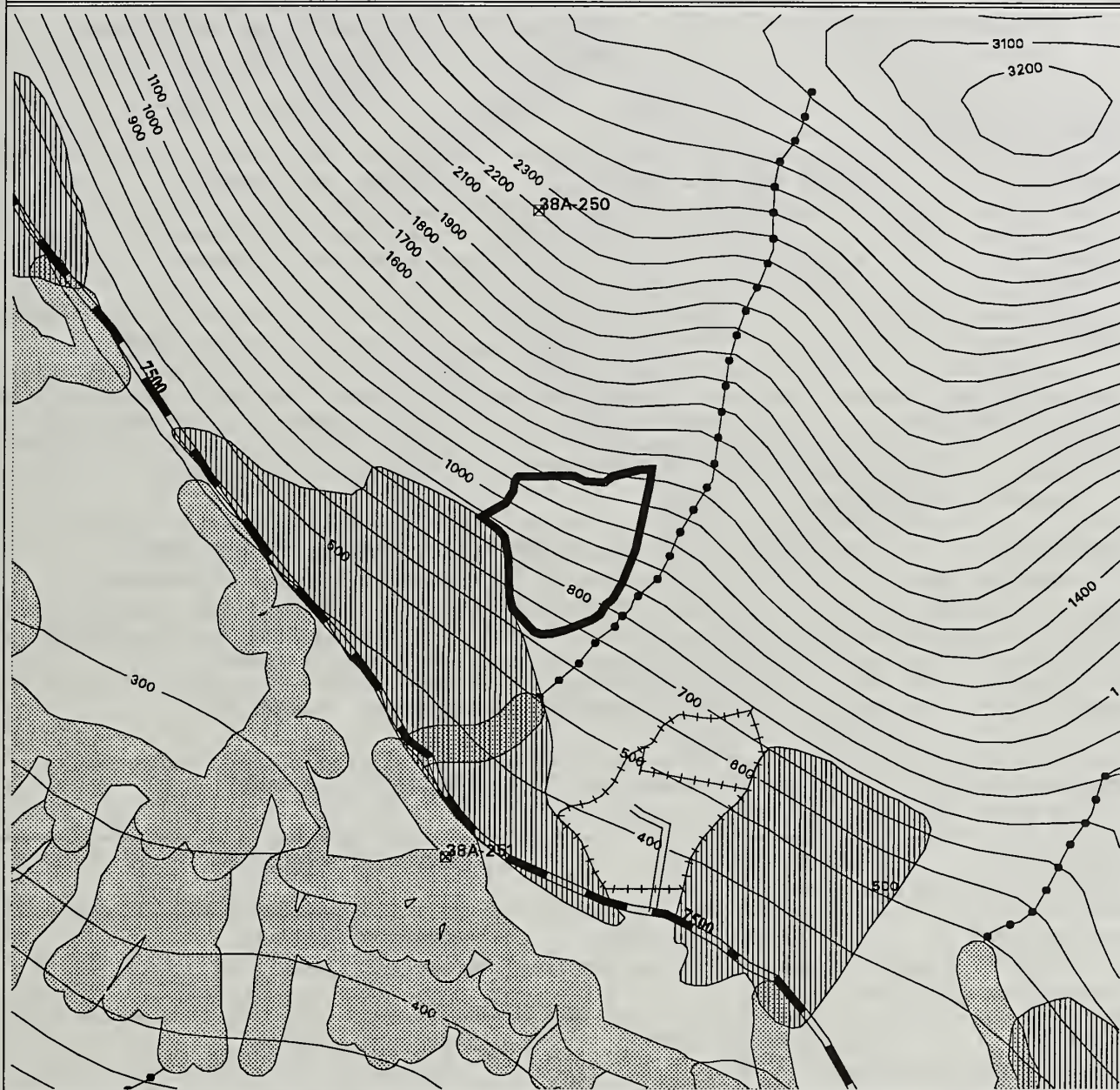
PLANNED HARVEST UNIT MAP

VCU: 2200UNIT NUMBER: 1610

QUAD(s): SITD4SW

ACRES: 14

Unit 1610 Occurs in Alternatives: B E F



100 FT CONTOUR INTERVAL

AREA LOCATOR

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM

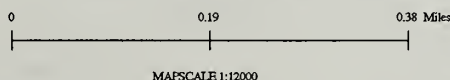
PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 2220
ACRES: 31.9

VCU: 2200
VOLUME (MBF): 521

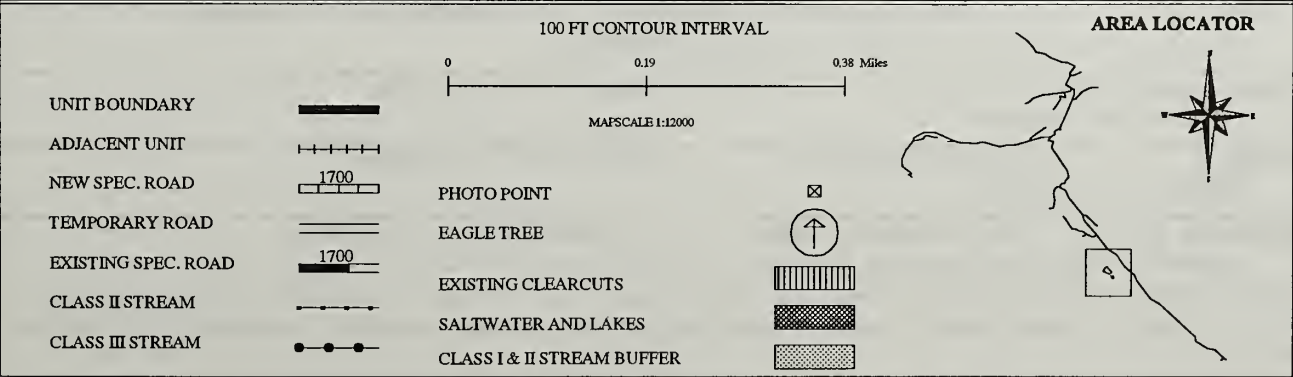
ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	468	Helicopter	Clearcut w/ retention
F	90	468	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Open forest/muskeg habitat. Low survey priority.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag multiple class II (category A) fish streams along lower boundary of main unit and on either side of isolated unit blocks. Maintain 100 foot buffer on class II category A streams, as per BMP 12.6a.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: G.KILLINGER	APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a; 13.16; Recommend windfirm boundary on class III streams. (Windfirm boundaries can be established by feathering buffer or harvesting trees with 1/3 or more of length above slope break to stream channel. Southeast winds are dominant in the Indian River Valley. However, the less frequent north winds can be severe.)		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Cedar decline, V-notches, volume. Recommend salvage, clearcut with retention, or group selection.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: S.GODFREY	APPROVED BY: M.REGAN
REMARKS: Decadent, uneconomical. Recommend clearcut, helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut with retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 2220 QUAD(s): SITD4SW
ACRES: 32 Unit 2220 Occurs in Alternatives: B F



INDIAN RIVER UNIT CARD

UNIT: 2310
ACRES: 9.7

VCU: 2200
VOLUME (MBF): 160

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	144	Helicopter	Clearcut w/ retention
E	90	144	Helicopter	Clearcut w/ retention
F	90	144	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag class II (category A) fish streams along lower boundary between unit blocks and on north and south boundaries. Maintain 100 ft. buffer on class II, category A streams, as per BMP 12.6a. Upstream of class II/III break, identified streams are category B. Leave windfirm boundary; recommend placing unit boundary at or above slope break of Class III channels (2/3 rule) on category B streams. Protect as per BMP 13.16 (and 13.3). Recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm, on category A streams.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Implement BMPs. (BMP 12.6a; 13.16). Recommend windfirm boundaries to class III streams.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention, helicopter yarding, partial suspension.

{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Recommend clearcut, helicopter harvest.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

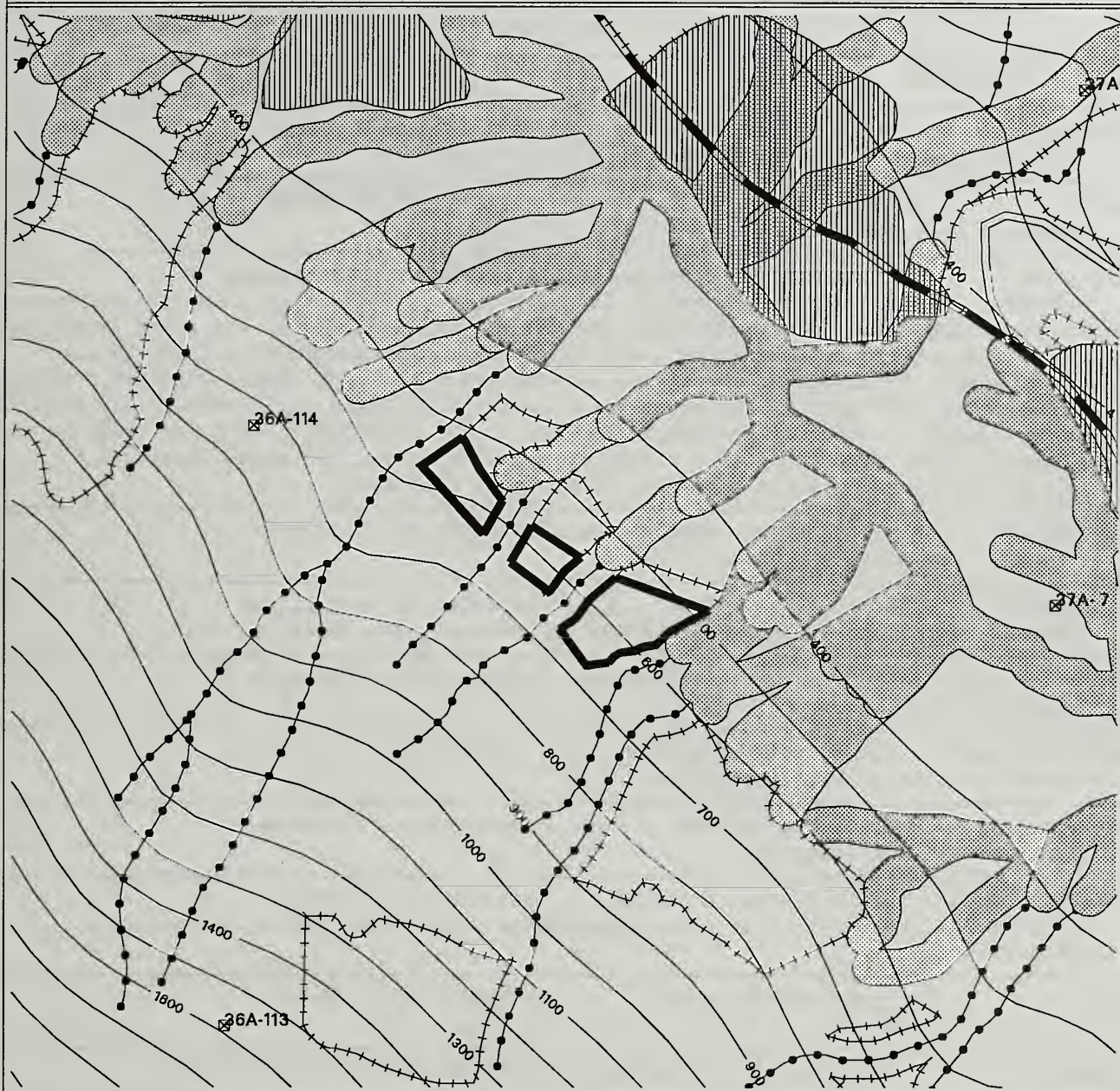
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Possible goshawk sighted; surveys did not locate nest in area. Continue goshawk surveys as funding allows. If active nest is located, implement TES goshawk S&G J.1.a) (1-6)b)c). When using clearcut with retention harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 2310 QUAD(s): SITD4SW
 ACRES: 10 Unit 2310 Occurs in Alternatives: B E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



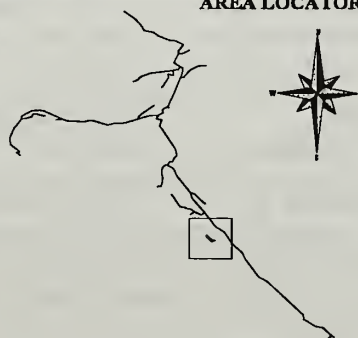
SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 2340

VCU: 2200

ACRES: 7.6

VOLUME (MBF): 138

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
E	90	124	Helicopter	Clearcut w/ retention
F	90	124	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag class II (category A) fish streams along lower boundary between unit blocks and along north and south boundaries. Maintain minimum of 100 ft. buffer on class II, category A streams, as per BMP 12.6a. Upstream of class II/III break, identified streams are category B. Leave windfirm boundary; recommend placing unit boundary at or above slope break of Class III channels (2/3 rule) on category B streams. Protect as per BMP 13.16 (and 13.3). Recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm, on category A streams.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundaries on streams. (BMP 12.6a; 13.16)

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention or Single Tree Selection salvage, helicopter yarding.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Possible goshawk sighted; surveys did not locate nest in area. Continue goshawk surveys as funding allows. If active nest is located, implement TES goshawk S&G J.1.a)(1-6)b)c). When using clearcut with retention harvest system, implement W/L marten S&G XVI.A.2.c).

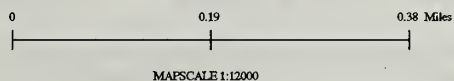
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 2340 QUAD(s): S1TD4SW
 ACRES: 8 Unit 2340 Occurs in Alternatives: E F



100 FT CONTOUR INTERVAL



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 2710

VCU: 2200

ACRES: 45.9

VOLUME (MBF): 667

ALTERNATIVE SUMMARY

ALTER-	PERCENT	HARVEST	HARVEST	HARVEST
NATIVE	HARVEST	VOLUME	METHOD	SYSTEM
E	90	601	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL
REMARKS: Open forest habitat; no sensitive plants found in unit; but some found outside, near unit.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Recommend additional buffer on lower fish streams in unit. Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along lower boundary (small streams) and north and south boundaries (larger AF1 and HC6 channels). Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a; recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm. Upstream of class II/III break, the deeply incised NW and SE boundary streams are category B. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary and recommend placing unit boundary at or above slope break of Class III channels (2/3 rule) on the category B streams.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundaries to class III streams. (BMP 12.6a; 13.16)

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend Single Tree Selection for 30% of volume or clearcut with retention.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Recommend feathered buffer on V-notch on northwest side for windfirmness and making a windfirm boundary on southeast side of unit.

{ TIMBER } FIELD REVIEW: L.WINN M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

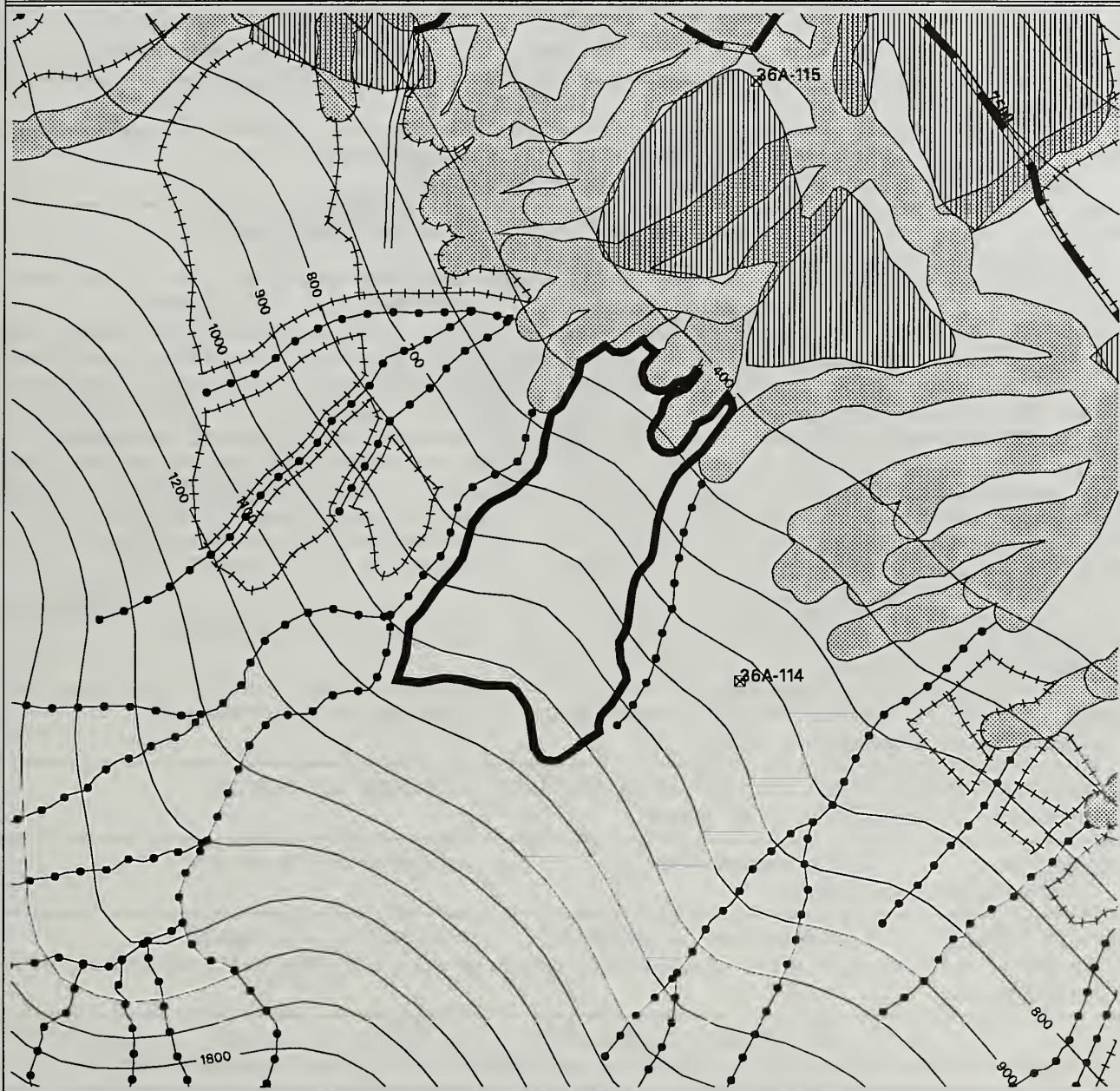
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut with retention harvest system, implement W/L marten S&G XVI.A.2.c).

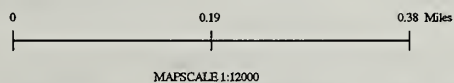
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 2710 QUAD(s): SITD4SW
 ACRES: 46 Unit 2710 Occurs in Alternatives: E



100 FT CONTOUR INTERVAL



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 2810
ACRES: 13.6

VCU: 2200
VOLUME (MBF): 288

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	259	Cable	Clearcut w/ retention
C	90	259	Cable	Clearcut w/ retention
F	90	259	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams along lower boundary small streams and larger streams on North and South (AF1 and HC6 channel) boundaries. Maintain min. 100-ft buffer on Class II, Category A streams (BMP 12.6a). Where possible, recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm. Upstream of class II/class III break, NW and S boundary streams are category B. Protect per BMP 13.16 (and 13.3). Leave windfirm boundary; recommend placing unit boundary at or above slope break of Class III channels (2/3 rule) on the category B streams.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend partial suspension, seed tree cut, clearcut with retention, or group selections.

{ **SOILS** } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Recommend partial suspension in southern 1/3 of unit. Leave windfirm boundary in southern boundary of unit. Split-yard v-notch in southern 1/3 of unit.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: Recommend clearcut with retention.

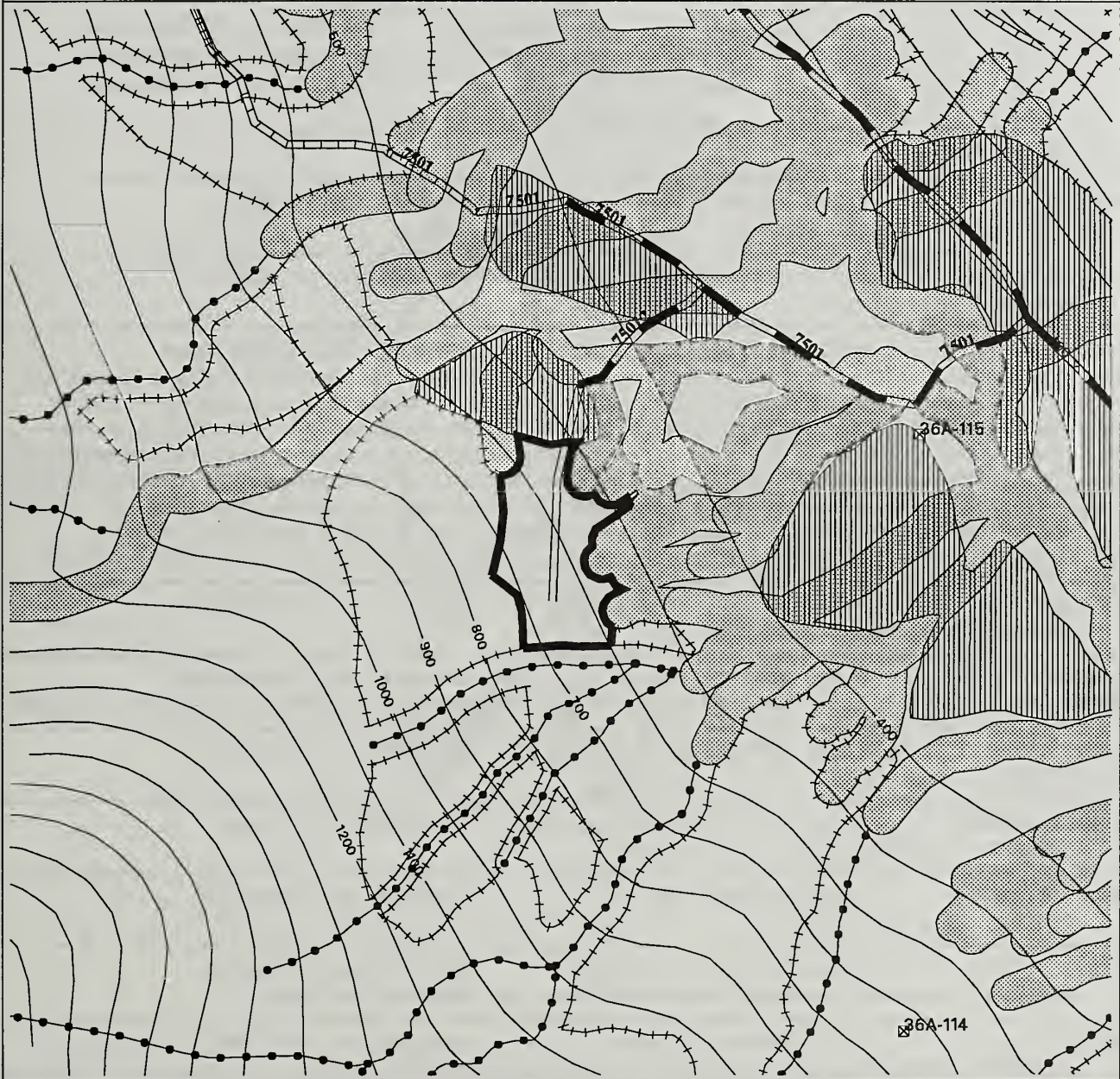
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

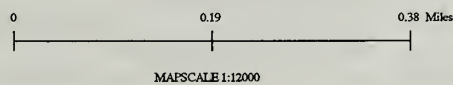
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 2810 QUAD(s): SITD4SW
 ACRES: 14 Unit 2810 Occurs in Alternatives: B C F



100 FT CONTOUR INTERVAL



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 2820
ACRES: 58.4

VCU: 2200
VOLUME (MBF): 1283

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	1155	Helicopter	Clearcut w/ retention
C	90	1155	Helicopter	Clearcut w/ retention
F	90	1155	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams on north end of unit, and category B, Class III streams on S and N boundaries and within unit. Maintain min. 100-ft buffer on Class II, Category A streams, (BMP 12.6a); where possible, recommend feathering adjacent to stream buffers(remove larger trees, retain nonmerchantable trees) to increase probability of remaining windfirm. The HC5 and HC6 channels within and bordering the unit are category B. Protect per BMP 13.16 (and 13.3). Leave windfirm boundary on category B streams. For N and S boundary streams, recommend placing unit boundary at or above slope break of Class III channels (2/3 rule).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a, 13.16. Recommend windfirm boundaries to v-notches (class III streams).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention or seed tree harvest.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on north and south boundaries of the unit. Cut all trees with more than 1/3 of their length above slope break of class 3 channels.

{ TIMBER } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: Recommend clearcut, helicopter harvest.

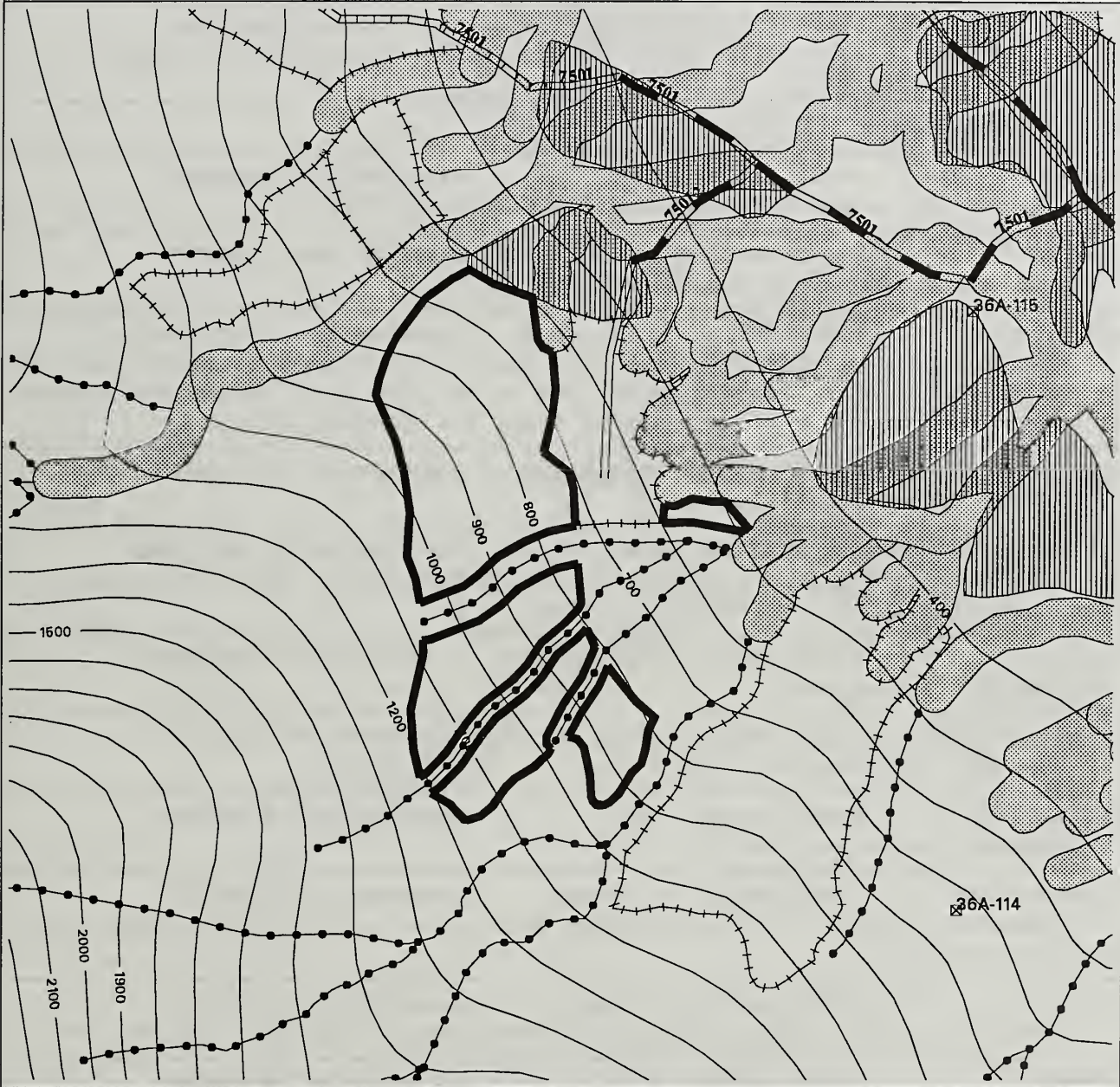
{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

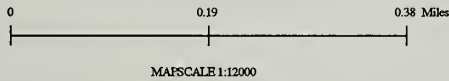
{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS:When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 2820 QUAD(s): SITD4SW
ACRES: 58 Unit 2820 Occurs in Alternatives: B C F



100 FT CONTOUR INTERVAL



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 3010
ACRES: 13.1

VCU: 2200
VOLUME (MBF): 225

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	45	Helicopter	Group Selection
F	90	203	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Deeply incised HC3 and HC6 channels on S and N boundaries are class III, category B streams. Protect as per BMP 13.16 (and 13.3). Recommend placing unit boundary at or above slope break of Class III channels (2/3 rule).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundaries on both sides, for cc w/retention alternative. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend group selections or clearcut with windfirm cedar and spruce retention.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on both sides of the unit for Alt. F.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

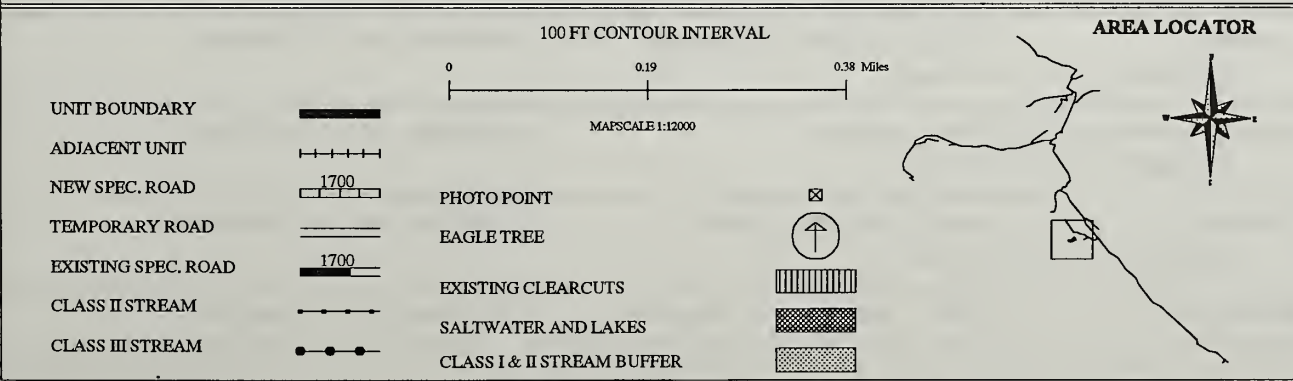
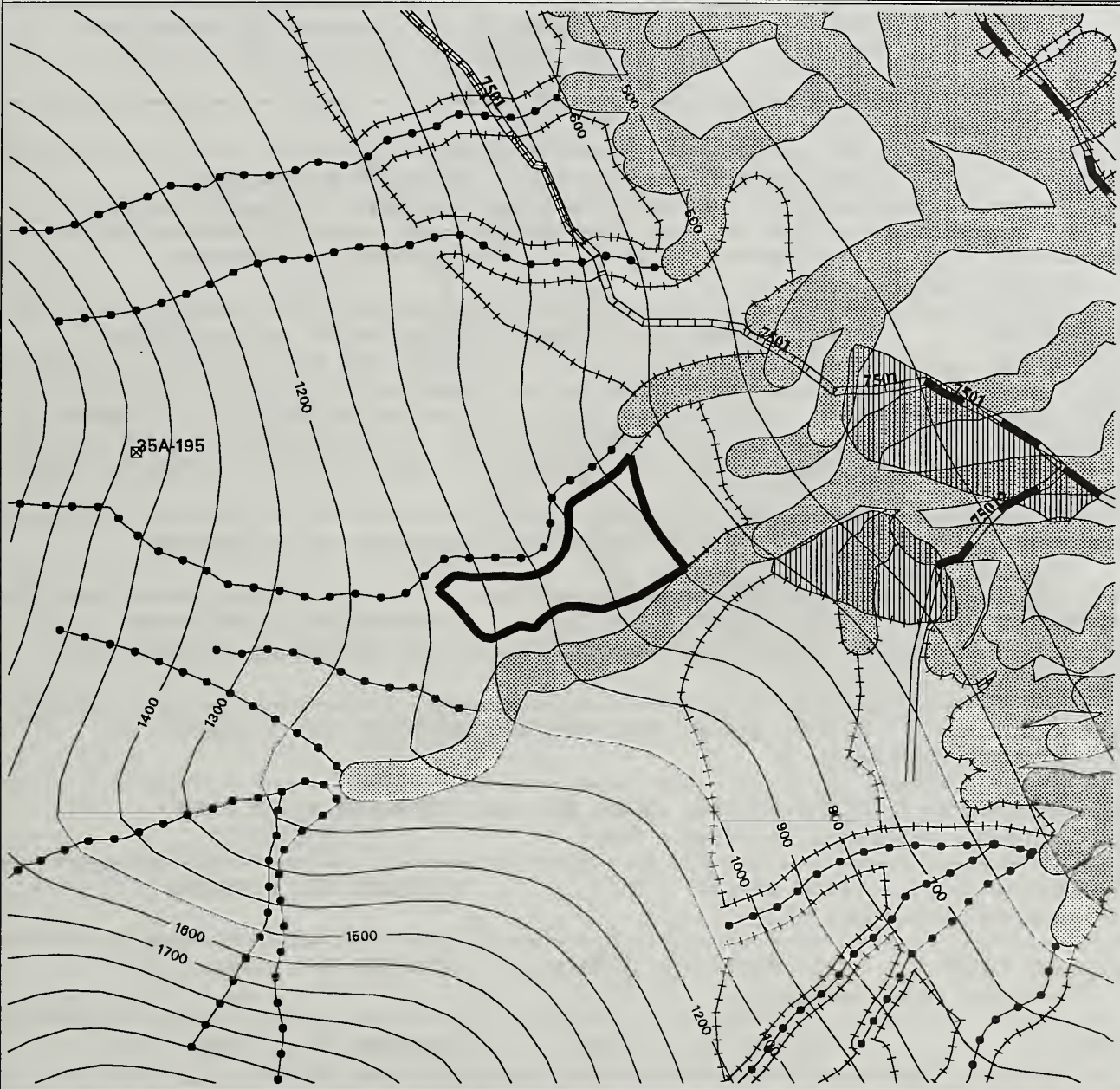
VCU: 2200

UNIT NUMBER: 3010

QUAD(s): SITD4SW

ACRES: 13

Unit 3010 Occurs in Alternatives: B F



INDIAN RIVER UNIT CARD

UNIT: 3020

VCU: 2200

ACRES: 8.5

VOLUME (MBF): 85

ALTERNATIVE SUMMARY

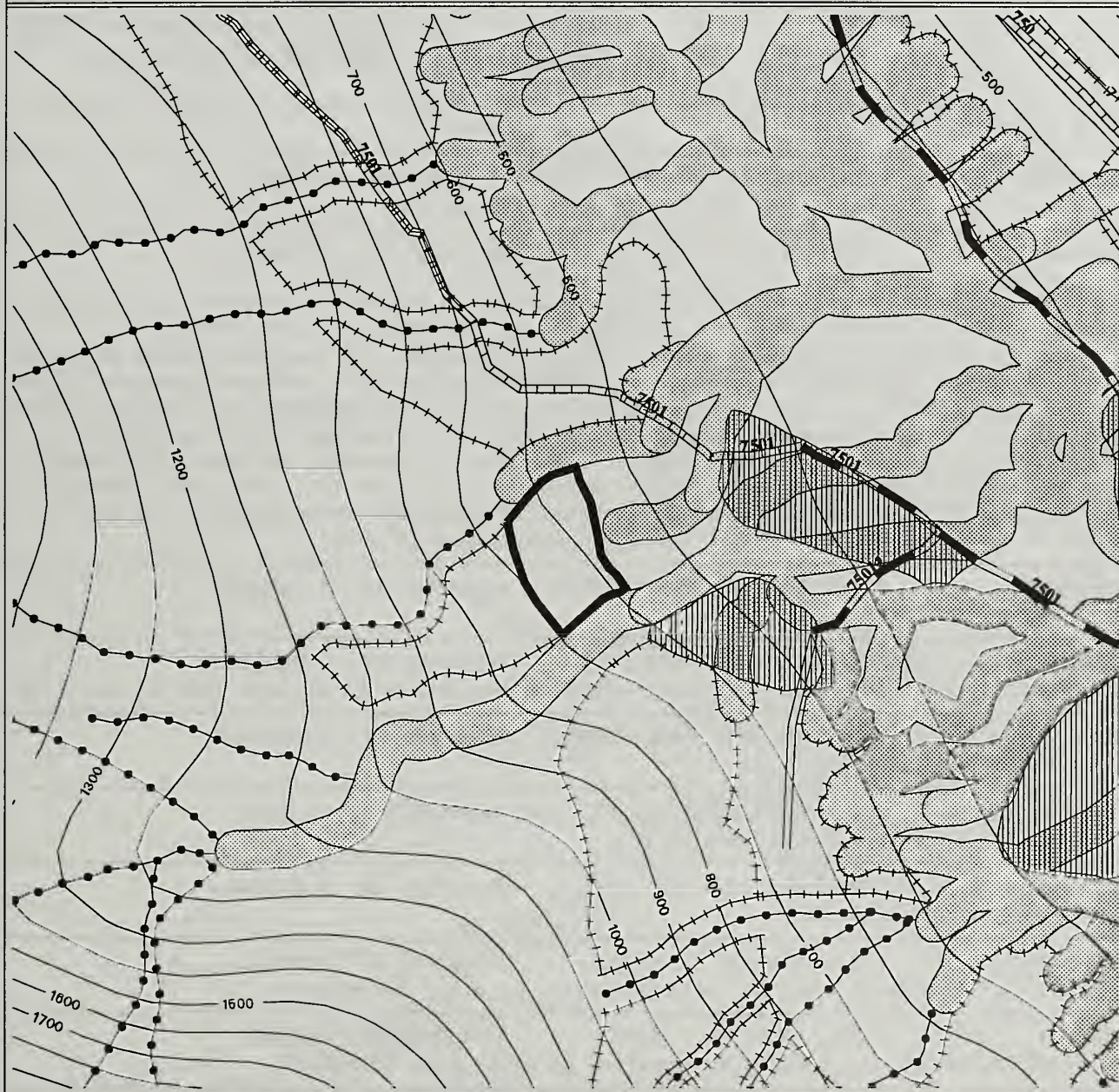
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
E	90	76	Helicopter	Clearcut w/ retention
F	90	76	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.SHEPHARD	APPROVED BY: S.TRULL
REMARKS: Open forested habitat. No sensitive plants found in survey.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along lower boundary and bordering N and S. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a; recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability that they will remain windfirm along north HC2 and south HC3/AF1 boundary streams.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Implement BMPs. Recommend windfirm boundaries to streams (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Recommend windfirm boundary on both sides of unit.		
{ TIMBER }	FIELD REVIEW: M.REGAN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: L.SHIPLEY	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

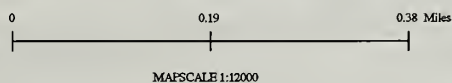
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3020 QUAD(s): SITD4SW
 ACRES: 8 Unit 3020 Occurs in Alternatives: E F



100 FT CONTOUR INTERVAL



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 3112
ACRES: 22.5

VCU: 2200
VOLUME (MBF): 389

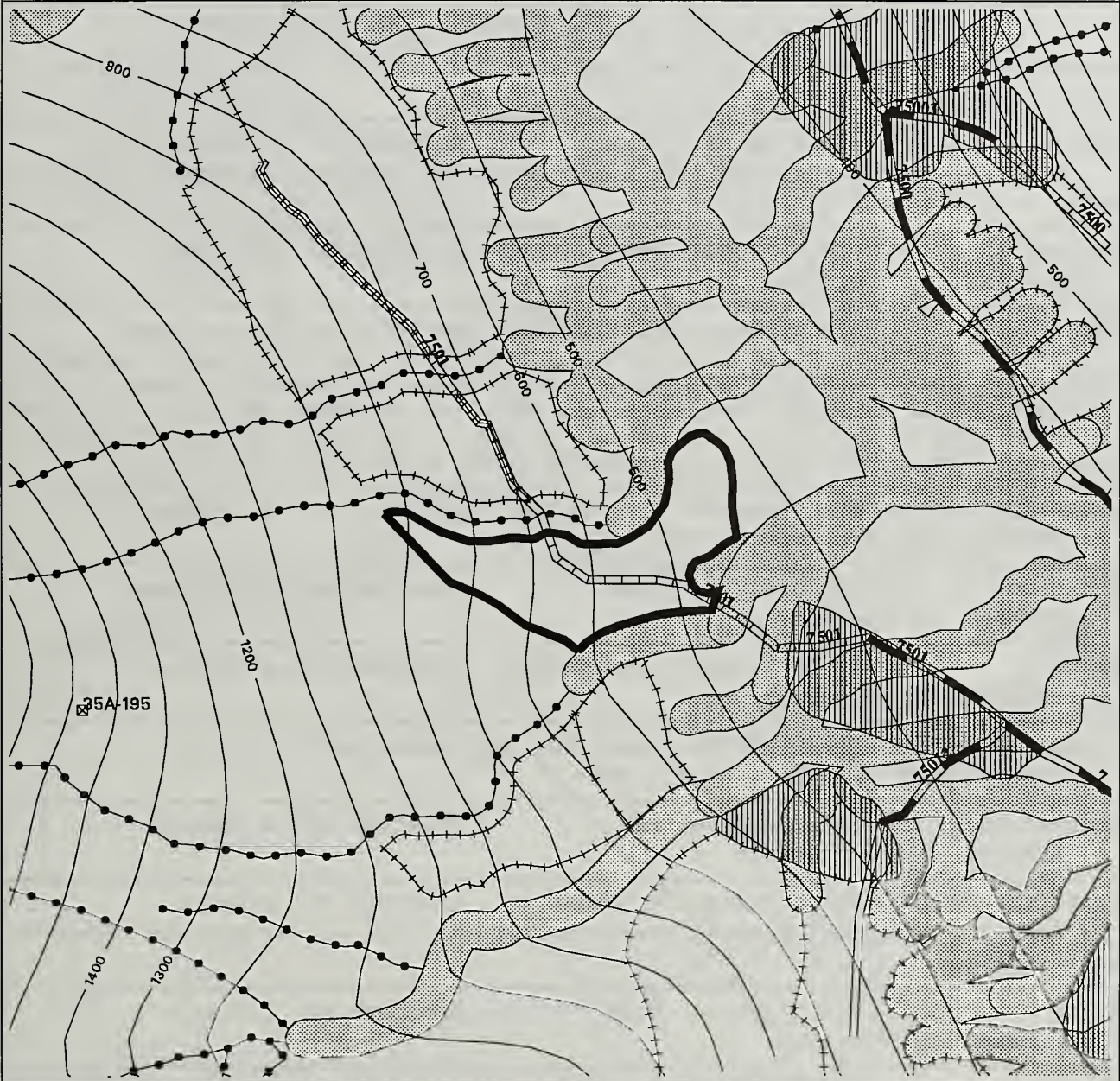
		ALTERNATIVE SUMMARY		
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	90	350	Cable	Clearcut w/ retention
F	90	350	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along S and lower NE boundaries. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a; recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability that they will remain windfirm, along N and S boundary streams where possible. Deeply incised HC6 channel on upper 2/3 of N boundary is class III, category B stream. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary; recommend placing unit boundary at or above slope break of Class III channels (2/3 rule).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Implement BMPs. Recommend windfirm boundaries to streams (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention or group selections.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Recommend a windfirm boundary on both sides of unit.		
{ TIMBER }	FIELD REVIEW: M.REGAN	APPROVED BY: M.REGAN
REMARKS: Recommend cable yarding.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: L.SHIPLEY	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

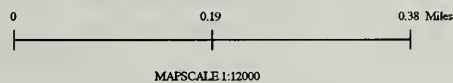
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3112 QUAD(s): SITD4SW
 ACRES: 22 Unit 3112 Occurs in Alternatives: C F



100 FT CONTOUR INTERVAL



AREA LOCATOR



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 3212 VCU: 2200
ACRES: 2.3 VOLUME (MBF): 42

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	35	15	Helicopter	Patch Clearcut

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Open forest habitat; moderate survey priority. Recommend botanist present during layout.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of category A fish streams (class II channels) along lower and NW boundaries. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a. Recommend placing unit boundary at or above slope break of Class III channels (2/3 rule) for deeply incised HC6 channel on NW boundary. Protect this class III, category B stream as per BMP 13.16 (and 13.3).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Group selections, overstory removal (70% of volume), or clearcut with retention.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: Combining with unit 3222 and group selections in Alternative B.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns.		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

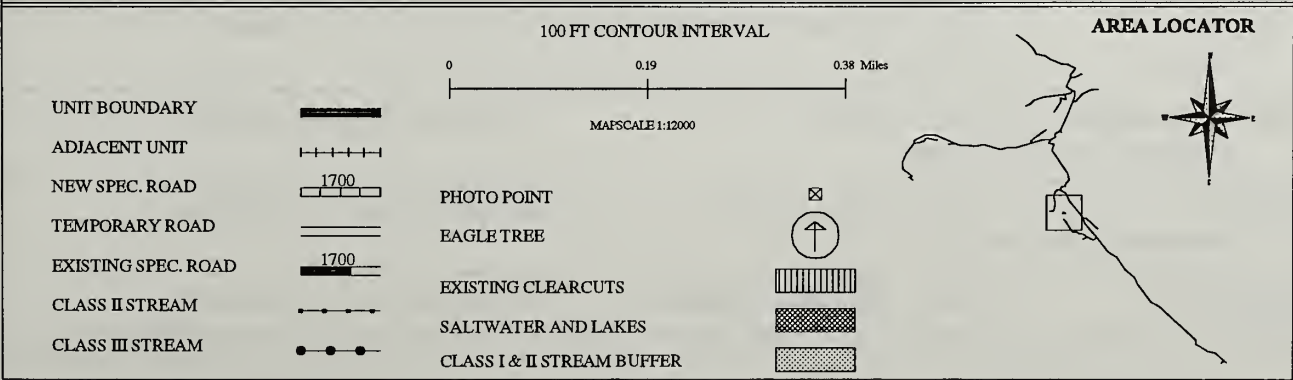
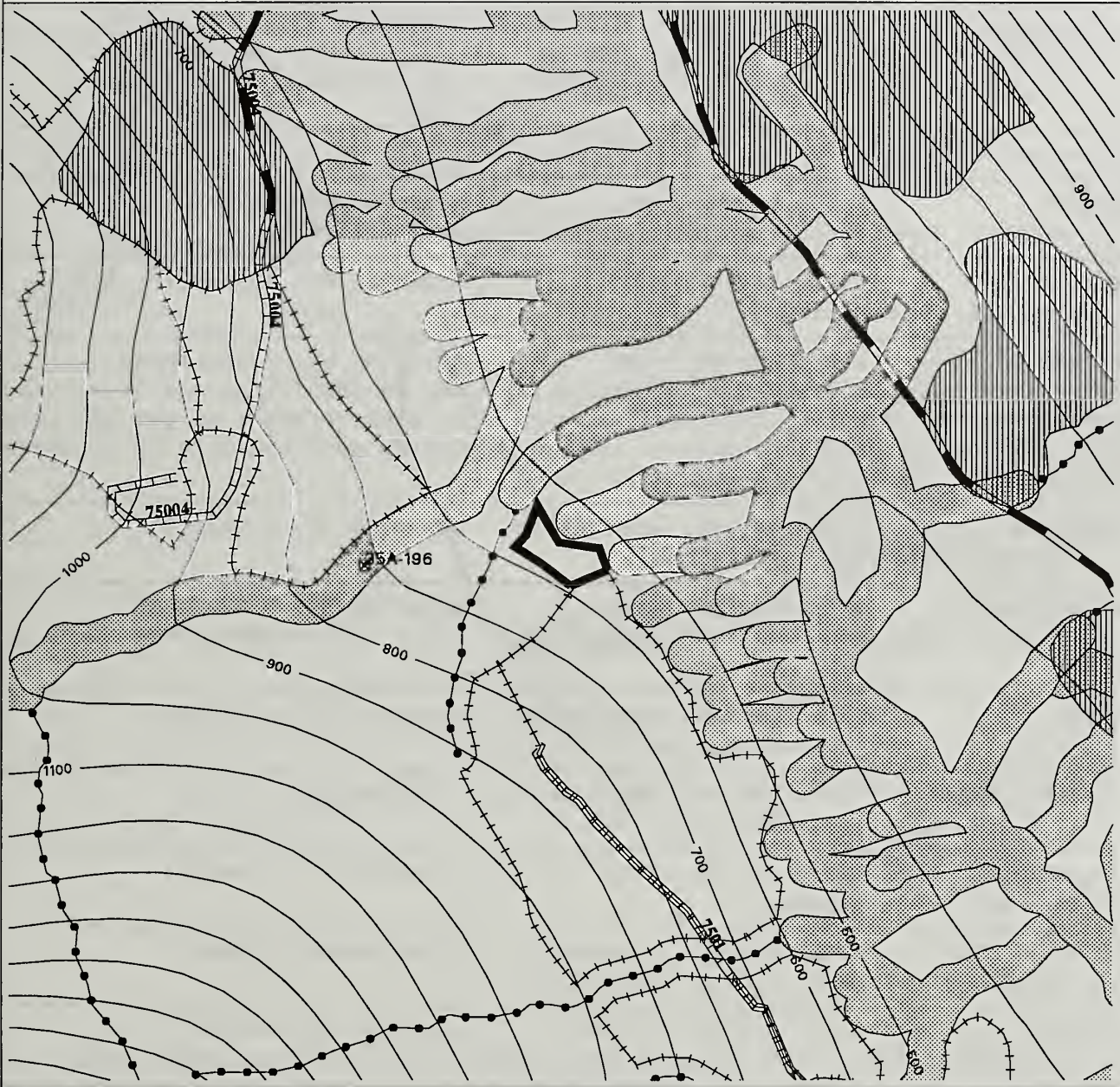
VCU: 2200

UNIT NUMBER: 3212

QUAD(s): SITD4SW

ACRES: 2

Unit 3212 Occurs in Alternatives: B



INDIAN RIVER UNIT CARD

UNIT: 3221
ACRES: 32.9

VCU: 2200
VOLUME (MBF): 941

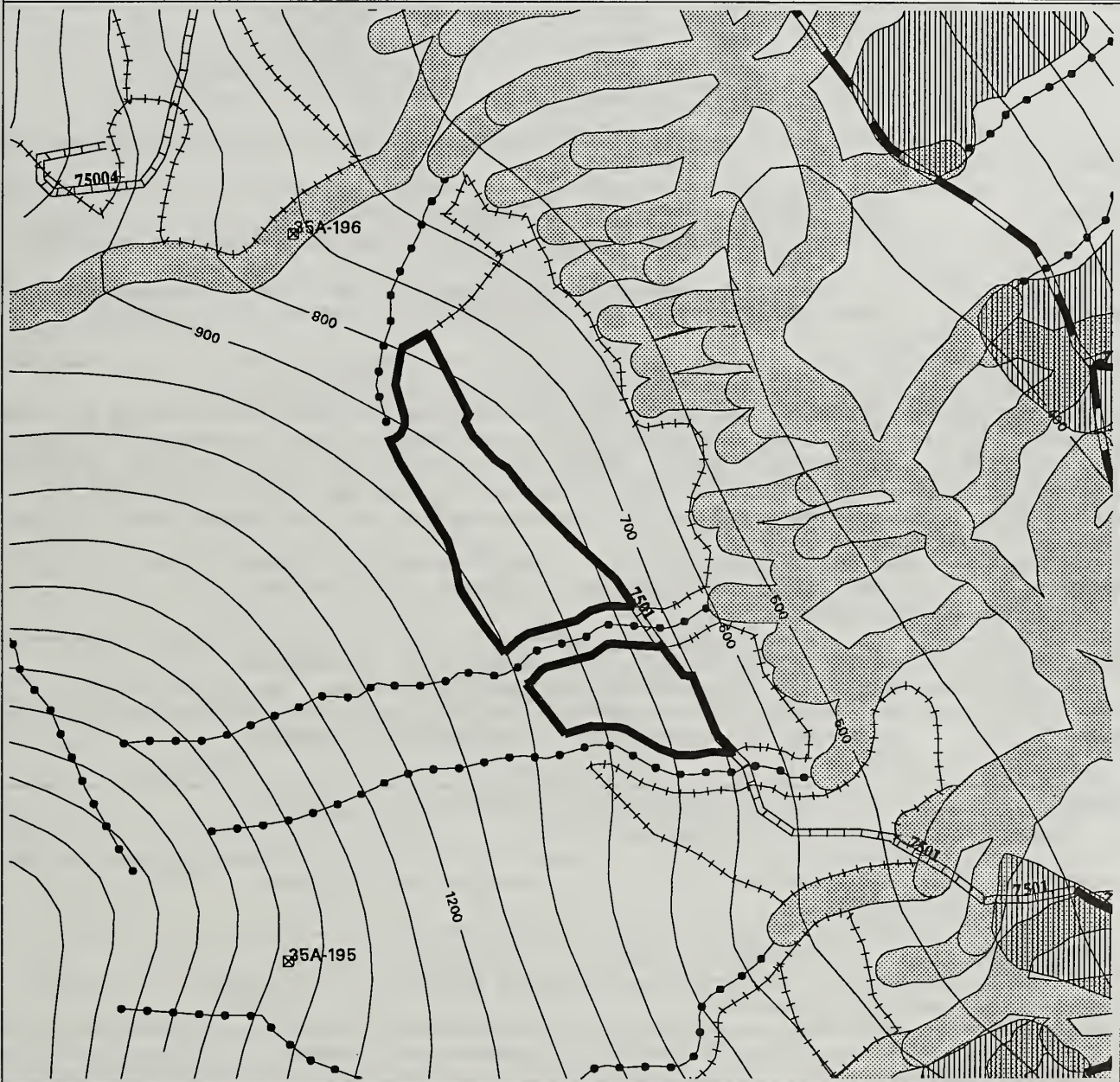
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	847	Cable	Clearcut w/ retention
C	90	847	Cable	Clearcut w/ retention
F	90	847	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: Deeply incised HC6 channels on S and NW boundaries and bisecting southern half of unit are class III, category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary; recommend placing unit boundary at or above slope break of Class III channels (2/3 rule).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundaries to class III streams. (BMP 12.6a; 13.16)		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend partial suspension.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Create windfirm leave strip along class 3 channel within unit.		
{ TIMBER }	FIELD REVIEW: M.REGAN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: SHIPLEY	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3221 QUAD(s): SITD4SW
 ACRES: 33 Unit 3221 Occurs in Alternatives: B C F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



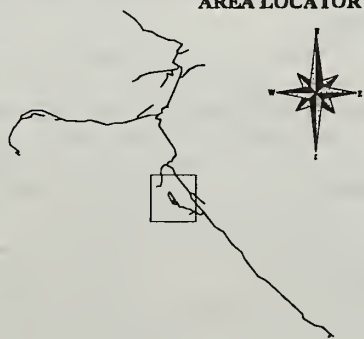
SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 3222
ACRES: 46.9

VCU: 2200
VOLUME (MBF): 1108

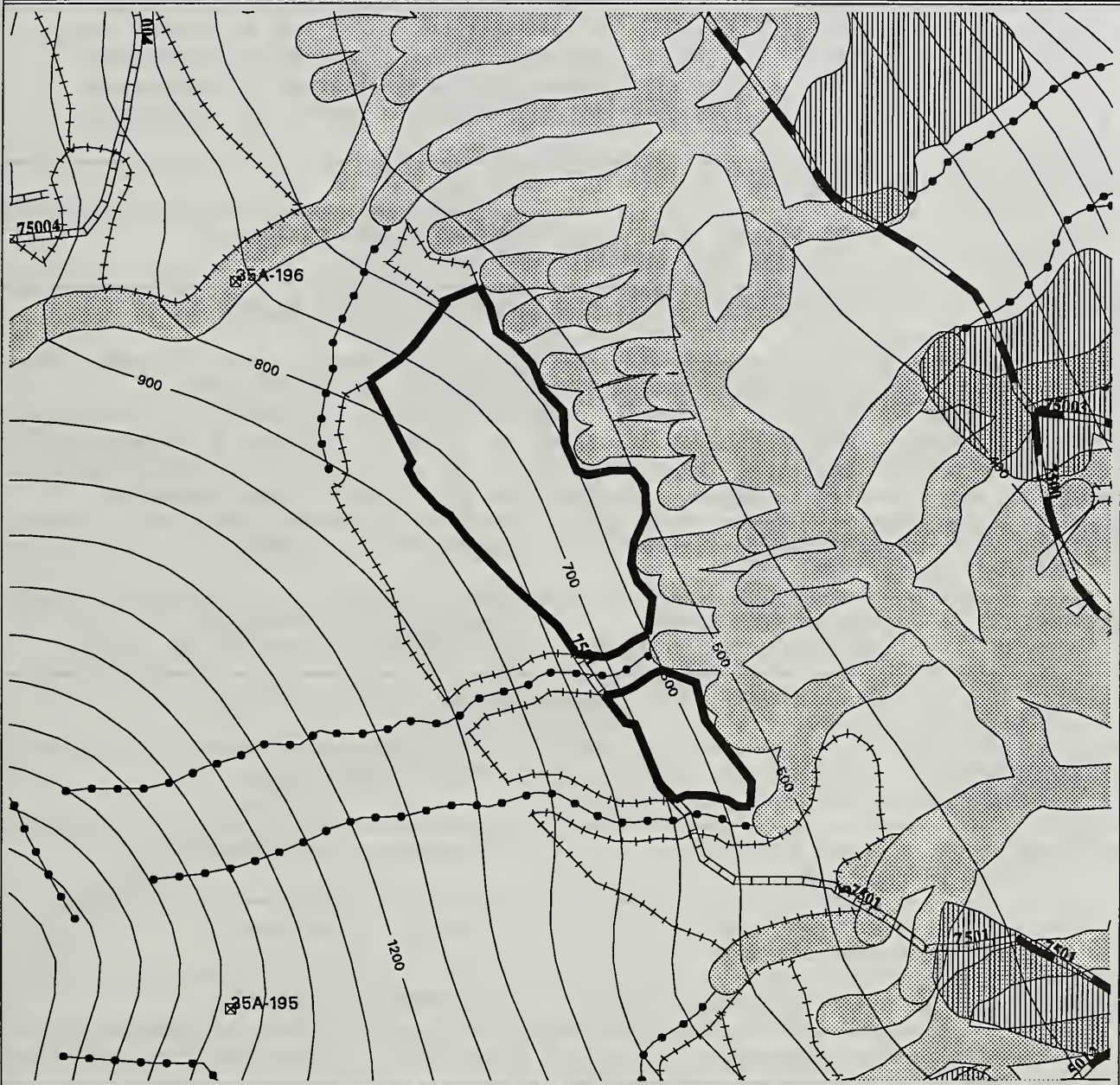
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	35	388	Cable	Patch Clearcut
C	35	388	Cable	Patch Clearcut
E	90	997	Cable	Clearcut w/ retention
F	90	997	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Open forest muskeg habitat; moderate survey priority. Recommend botanist present during layout.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of category A streams (many class II) along lower and S boundary and in southern ½ of unit. Maintain min. 100-ft buffer on Class II, Category A streams, (BMP 12.6a). HC6 channels on S boundary and within southern ½ of unit are class III, category B streams. Protect per BMP 13.16 (and 13.3). Leave windfirm boundary; recommend placing unit boundary at or above slope break of Class III channels (2/3 rule).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundaries to class III streams. BMP 12.6a, 13.16.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend Patch Clearcuts, overstory removal (70% of volume), or clearcut with retention, partial suspension.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Create windfirm leave strip along class 3 channel within unit in cc alts.		
{ TIMBER }	FIELD REVIEW: M.REGAN	APPROVED BY: M.REGAN
REMARKS: Recommend cable, clearcut, access by a specified road.		
{ TRANSPORTATION }	FIELD REVIEW: G.VIRTUE	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: L.SHIPLEY	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3222 QUAD(s): SITD4SW
 ACRES: 47 Unit 3222 Occurs in Alternatives: B C E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



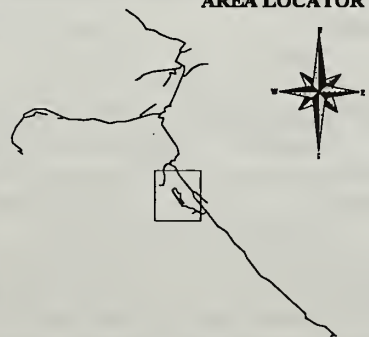
SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 3520
ACRES: 30.8

VCU: 2200
VOLUME (MBF): 613

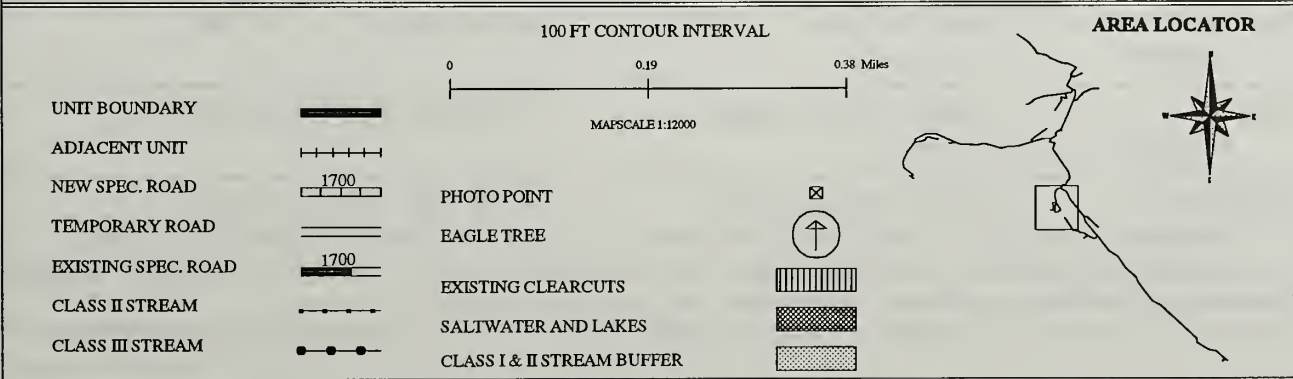
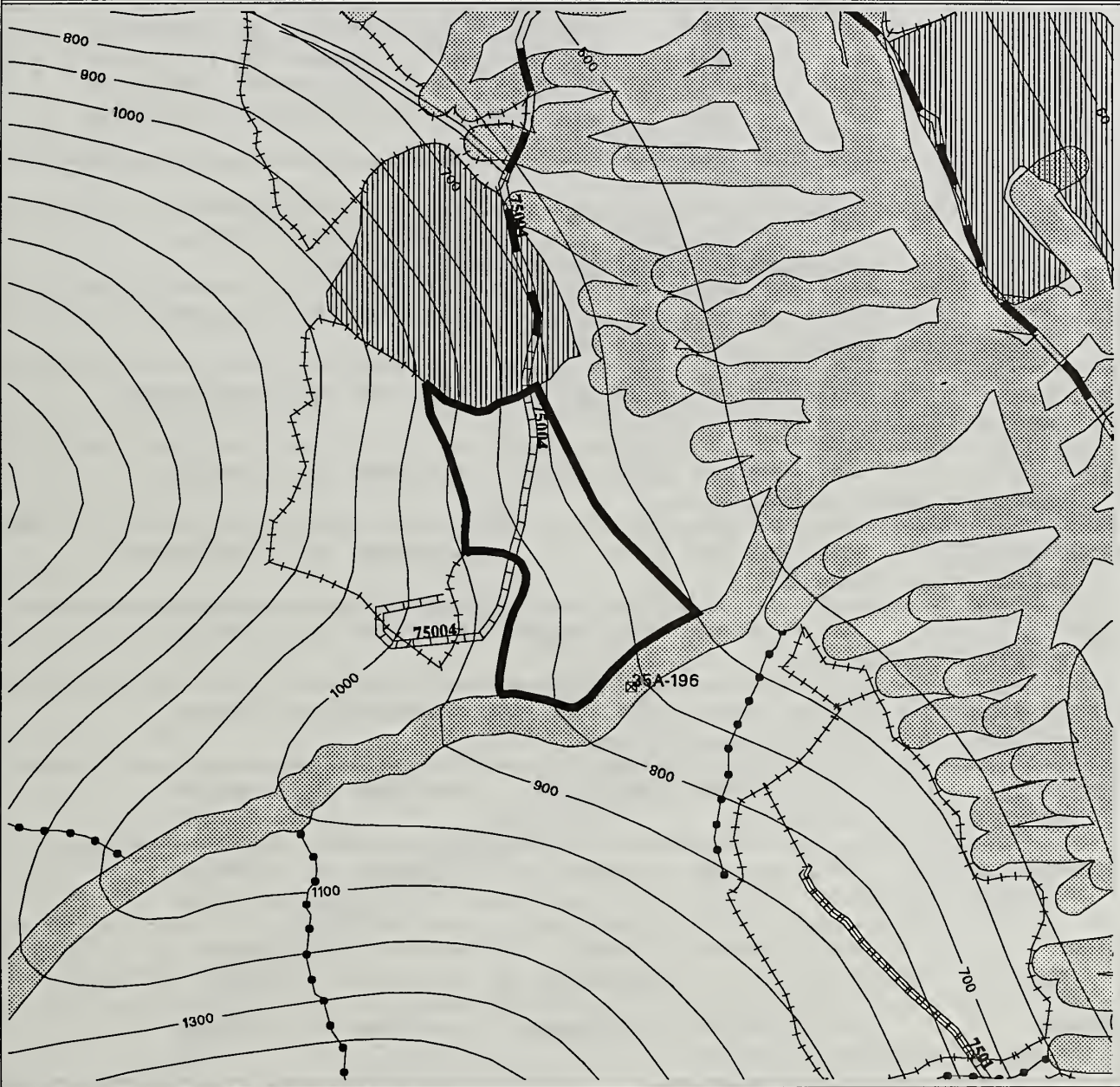
ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	552	Helicopter/cable	Clearcut w/ retention
C	90	552	Helicopter/cable	Clearcut w/ retention
E	90	552	Helicopter/cable	Clearcut w/ retention
F	90	552	Helicopter/cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Deeply incised HC3 channel on south boundary is class II, category A fish stream. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a; recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to stream channel. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Assuming the unit will be cable, split-yard v-notch in northern end of unit; recommend partial suspension on eastern side of unit. Leave windfirm boundary on southeast side of unit; feather if possible.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: G.VIRTUE	APPROVED BY: B.CRIDER
REMARKS: Recommend a specified road to access unit.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3520 QUAD(s): SITD4SW
ACRES: 31 Unit 3520 Occurs in Alternatives: B C E F



INDIAN RIVER UNIT CARD

UNIT: 3530
ACRES: 32.3

VCU: 2200
VOLUME (MBF): 717

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	646	Helicopter/Cable	Clearcut w/ retention
C	90	646	Helicopter/Cable	Clearcut w/ retention
E	90	646	Helicopter/Cable	Clearcut w/ retention
F	90	646	Helicopter/Cable	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: No concerns.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention, helicopter yarding.

{ **SOILS** } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Recommend partial suspension in center and north end of unit.

{ **TIMBER** } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: Recommend profile.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

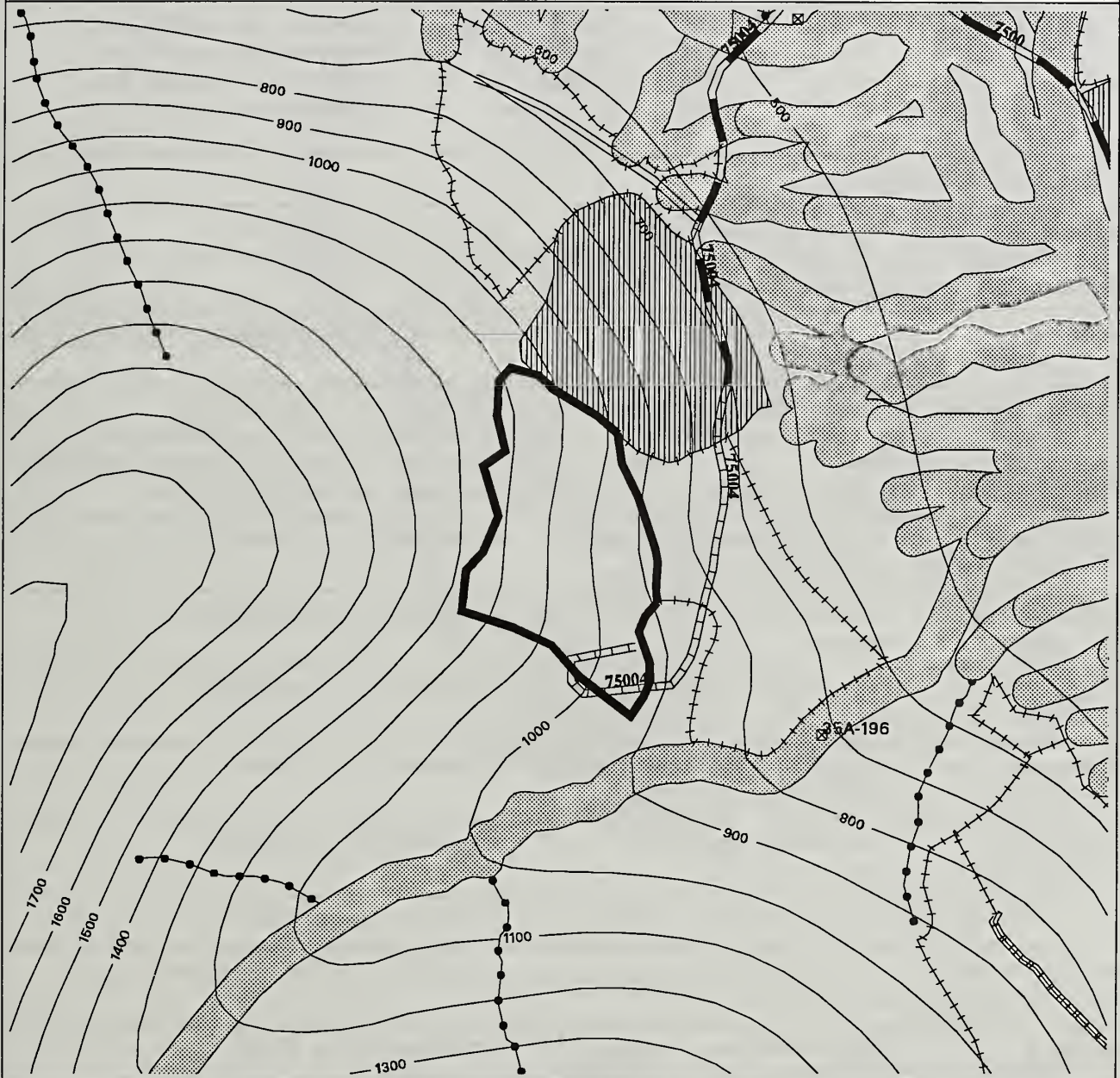
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Red-tail hawk seen; no nest located. Survey as funding allows. If active nest is located, implement W/L raptor nest S&G X.A.1-3. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3530 QUAD(s): SITD4SW
 ACRES: 32 Unit 3530 Occurs in Alternatives: B C E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 3610
ACRES: 25.7

VCU: 2200
VOLUME (MBF): 559

ALTERNATIVE SUMMARY

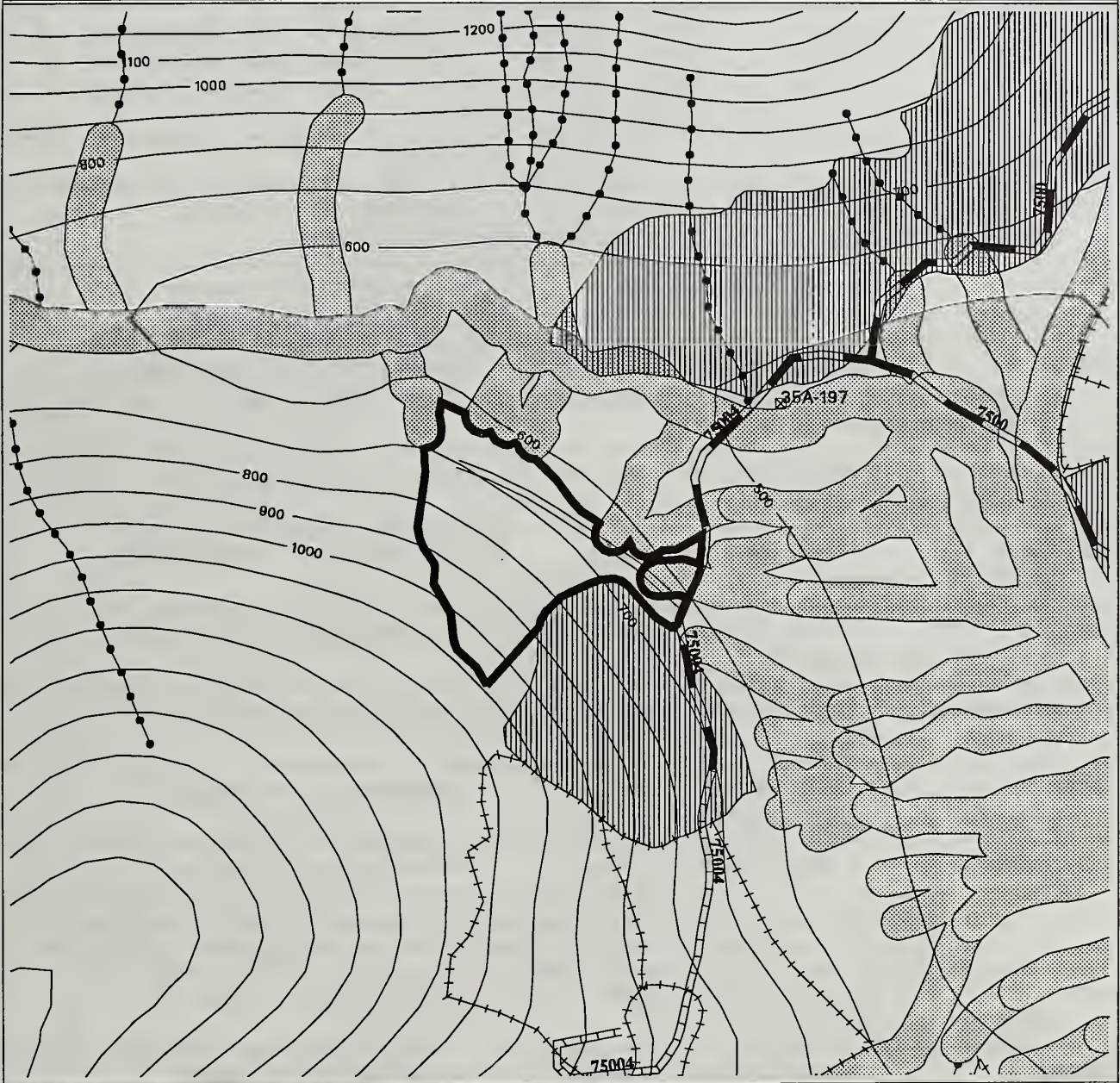
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	504	Cable	Clearcut w/ retention
C	90	504	Cable	Clearcut w/ retention
E	90	504	Cable	Clearcut w/ retention
F	90	504	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Open forest, subalpine/alpine habitat; moderate survey priority. Recommend botanist present during layout.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of category A fish streams (class II streams) along lower N and NE boundaries. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention, cable yarding. Also recommend cedar overstory removal (all merchantable volume) in east half of unit, clearcut with retention in west half of unit.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Split-yard v-notch in southern end of unit.		
{ TIMBER }	FIELD REVIEW: G.PETERSON , L.WINN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: Recommend accessing unit with temporary road.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3610 QUAD(s): SITD5SE/SITD4SW
 ACRES: 26 Unit 3610 Occurs in Alternatives: B C E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 4011 VCU: 2200
ACRES: 5.4 VOLUME (MBF): 193

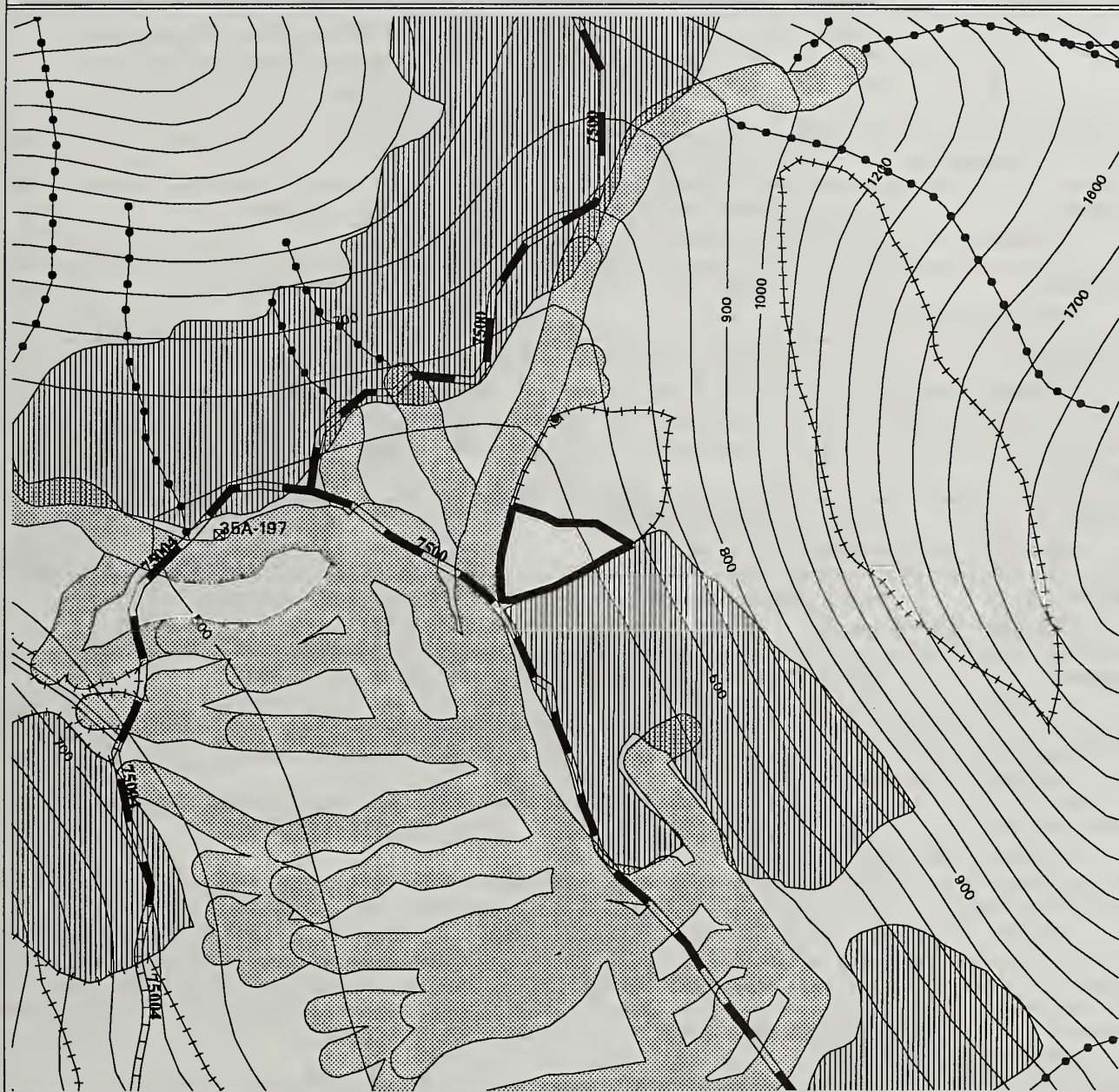
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	20	39	Shovel	Single Tree Selection
E	20	39	Shovel	Single Tree Selection
F	20	39	Shovel	Single Tree Selection

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Implement ≈101 ft. wide riparian conservation zones on spring fed, class I, MM1 channel on W boundary.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend partial cut due to blowdown concerns, or clearcut with retention. May be an active red-tail hawk nest in area. Regeneration concern, the unit may come back in devil's club. Could Single Tree Selection for 20% of volume to maintain windfirmness.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: K.RUTLEDGE	APPROVED BY: L.SHIPLEY
REMARKS: High wildlife use. Single Tree Selection will help maintain suitable habitat characteristics. If active Red-tail hawk nest is located, implement W/L raptor nest S&G X.A.1-3.		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 4011 QUAD(s): SITD4SW
 ACRES: 5 Unit 4011 Occurs in Alternatives: C E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 4012
ACRES: 11.9

VCU: 2200
VOLUME (MBF): 343

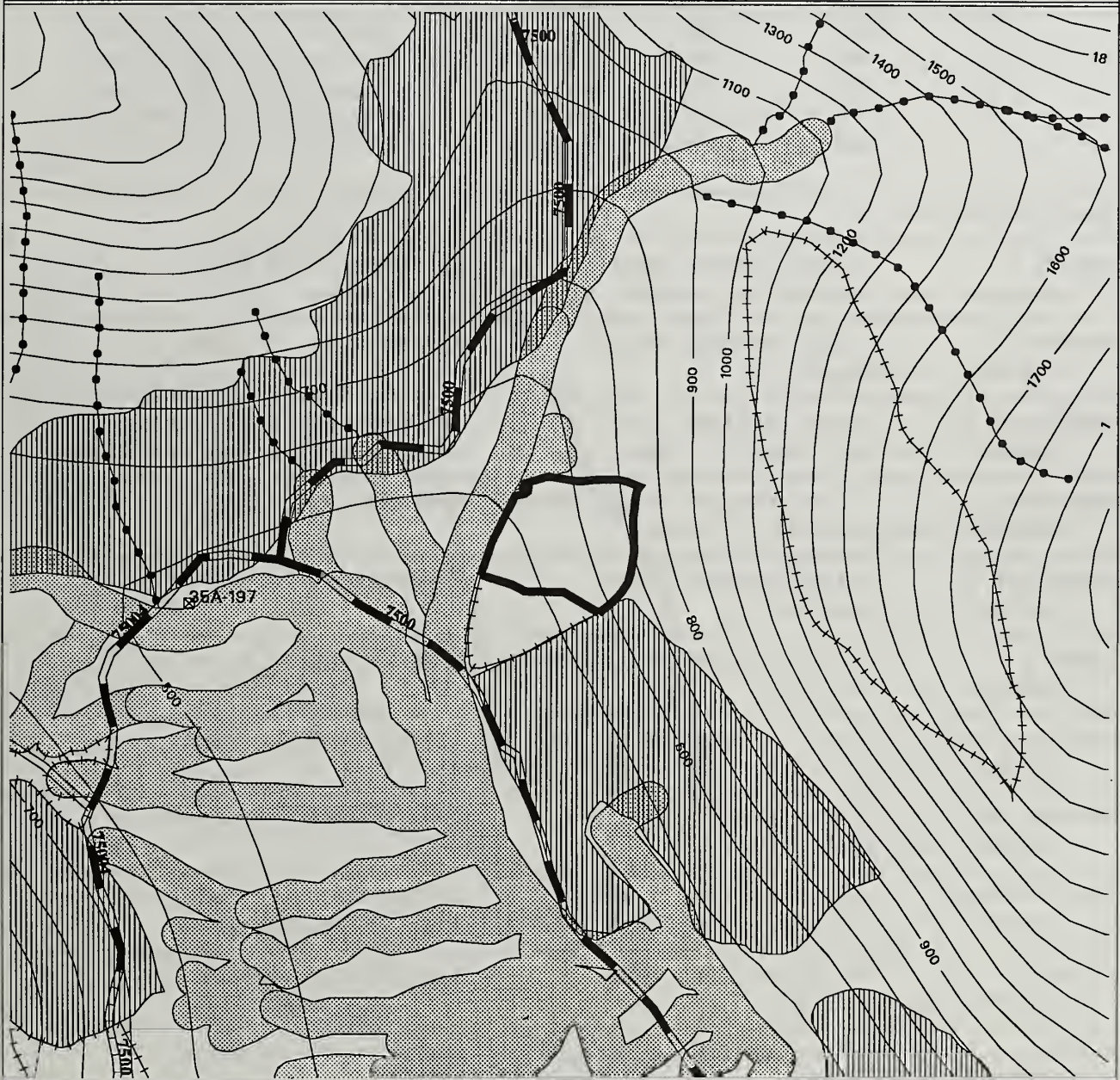
		ALTERNATIVE SUMMARY		
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	20	69	Helicopter	Single Tree Selection
E	20	69	Helicopter	Single Tree Selection
F	20	69	Helicopter	Single Tree Selection

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Implement ≈101 ft. wide riparian conservation zones on spring fed, class I, MM1 channel on W boundary. Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams in NW corner and along W boundary.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate/High.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend partial cut due to blowdown concerns, or clearcut with retention. May be an active red-tail hawk nest in area. Regeneration concern, the unit may come back in devil's club. Could single tree select for 20% of volume to maintain windfirmness.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: K.RUTLEDGE	APPROVED BY: L.SHIPLEY
REMARKS: High wildlife use. Single Tree Selection will help maintain suitable habitat characteristics. If active Red-tail hawk nest is located, implement W/L raptor nest S&G X.A.1-3.		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 4012 QUAD(s): SITD4SW
 ACRES: 12 Unit 4012 Occurs in Alternatives: C E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 4120
ACRES: 58.7

VCU: 2200
VOLUME (MBF): 1073

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	965	Helicopter	Clearcut w/ retention
C	90	965	Helicopter	Clearcut w/ retention
D	90	965	Helicopter	Clearcut w/ retention
E	90	965	Helicopter	Clearcut w/ retention
F	90	965	Helicopter	Clearcut w/ retention

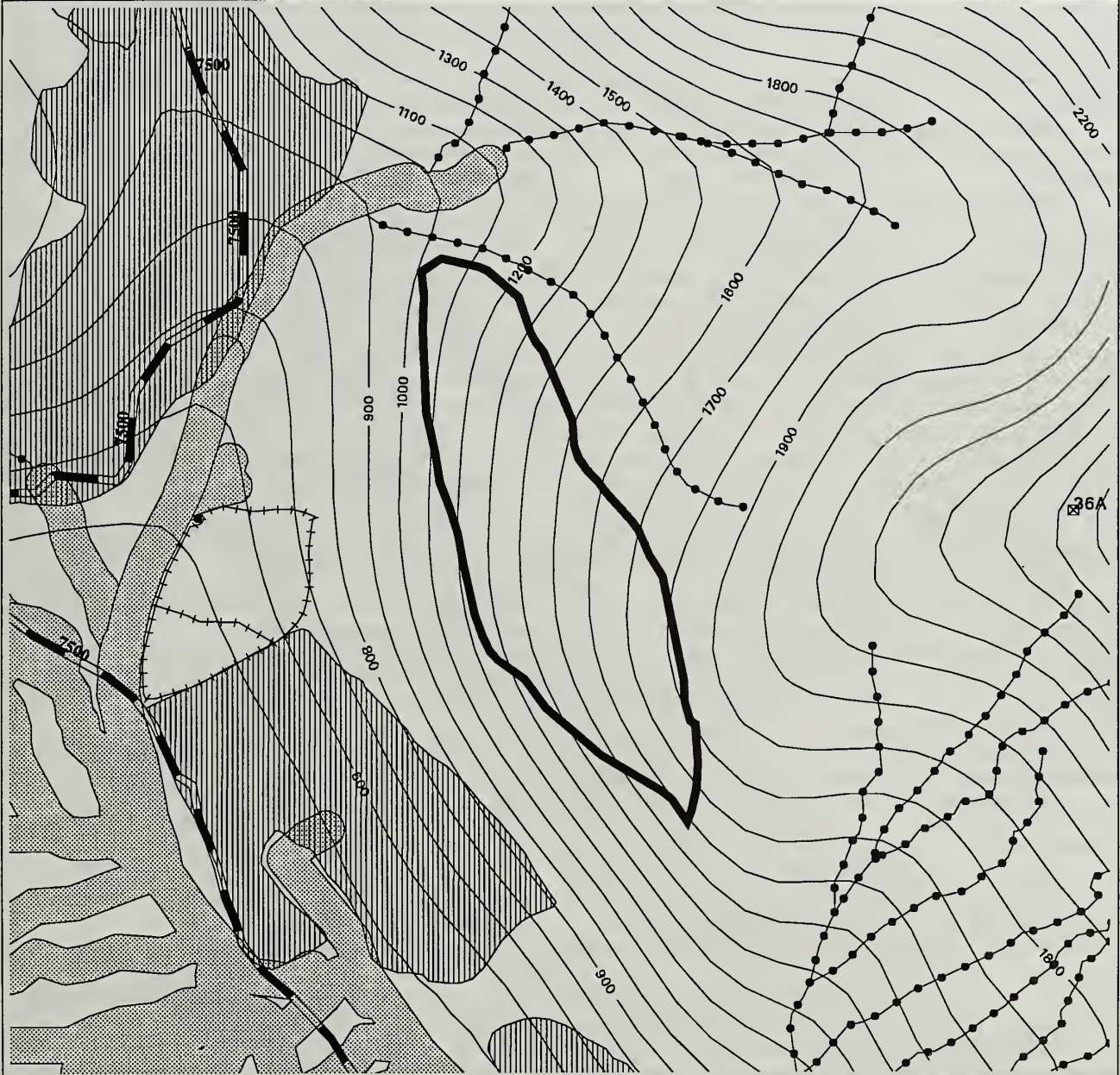
REVIEW INFORMATION

{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: See hydrology for water quality concerns on N boundary stream.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate/High.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention due to decadence.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: B.BEALL	APPROVED BY: M.REGAN
REMARKS: Recommend clearcut, helicopter yarding.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 4120 QUAD(s): SITD4SW
 ACRES: 59 Unit 4120 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



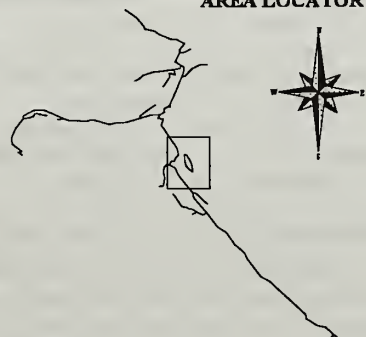
SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 4420
ACRES: 38.2

VCU: 2200
VOLUME (MBF): 1105

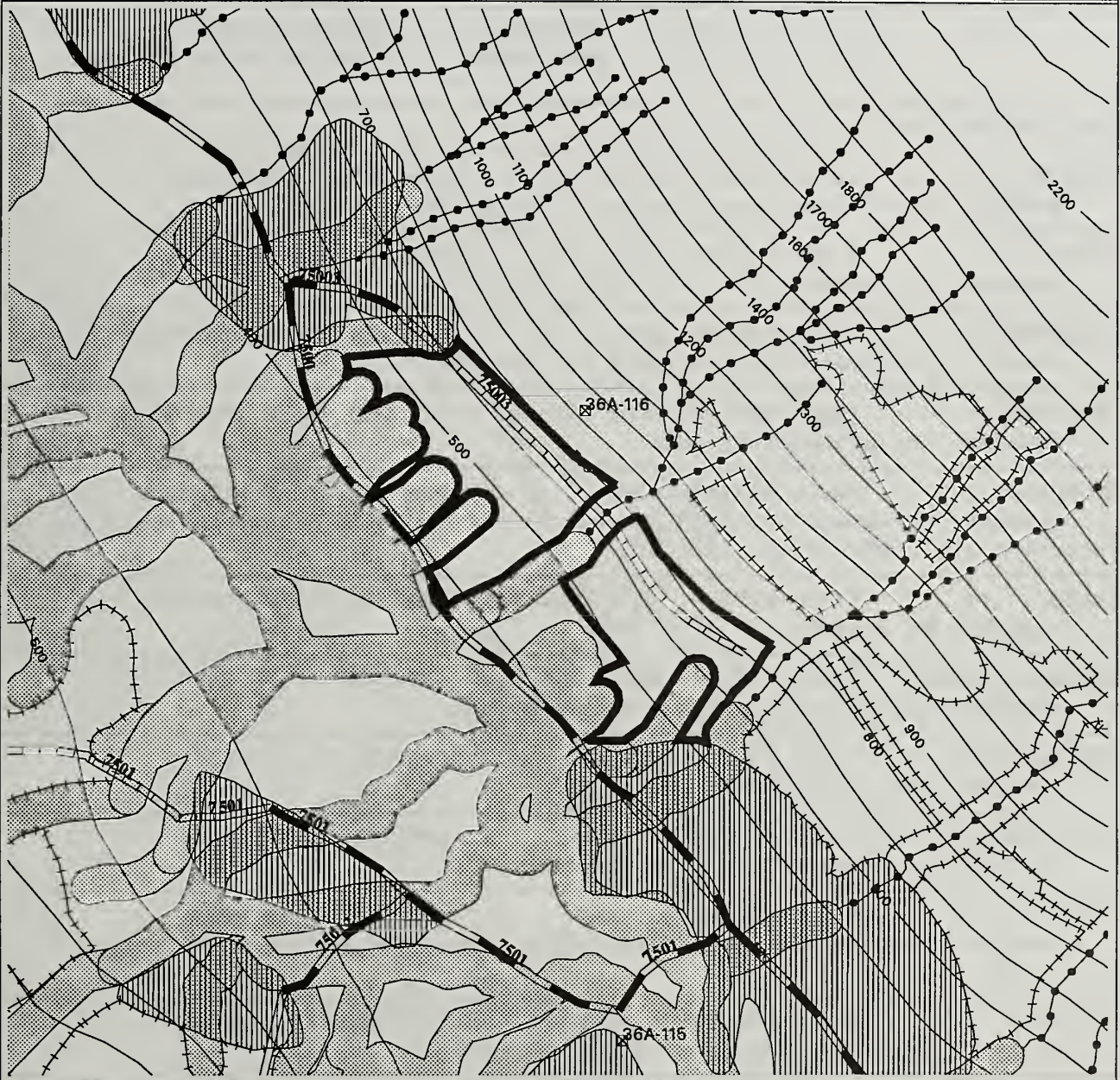
		ALTERNATIVE SUMMARY		
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	994	Cable	Clearcut w/ retention
F	90	994	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics. Recommend cable yarding.		
{ FISHERIES }	FIELD REVIEW: S.JACOBSON	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams along lower boundary and N and S boundaries, and a number of class III, category C streams that continue uphill from the small class I streams. Maintain minimum of 100-ft buffer on Class I and II, Category A streams (BMP 12.6a), and protect category C streams (BMP 13.16 and 13.3). Leave windfirm boundary (especially on S side of buffers which face prevailing winds) on AF1/HC6 stream in middle of unit and HC2/HC6 stream on S boundary. Where possible, recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability of remaining windfirm. HC6 channels in upper middle and S boundary of unit are class III, category B streams. Protect per BMP 13.16 (and 13.3).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm leave strip on central class III stream. (BMP 12.6a; 13.16)		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate/High.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention due to high blowdown potential and stand decadence.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Create windfirm leave strip along class 3 channel within unit.		
{ TIMBER }	FIELD REVIEW: G.PETERSON	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: K.RUTLEDGE	APPROVED BY: L.SHIPLEY
REMARKS: Buffers provide vertical travel corridor. Creates large opening when adjacent clearcuts are considered. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 4420 QUAD(s): SITD4SW
 ACRES: 38 Unit 4420 Occurs in Alternatives: B F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 4440
ACRES: 20.0

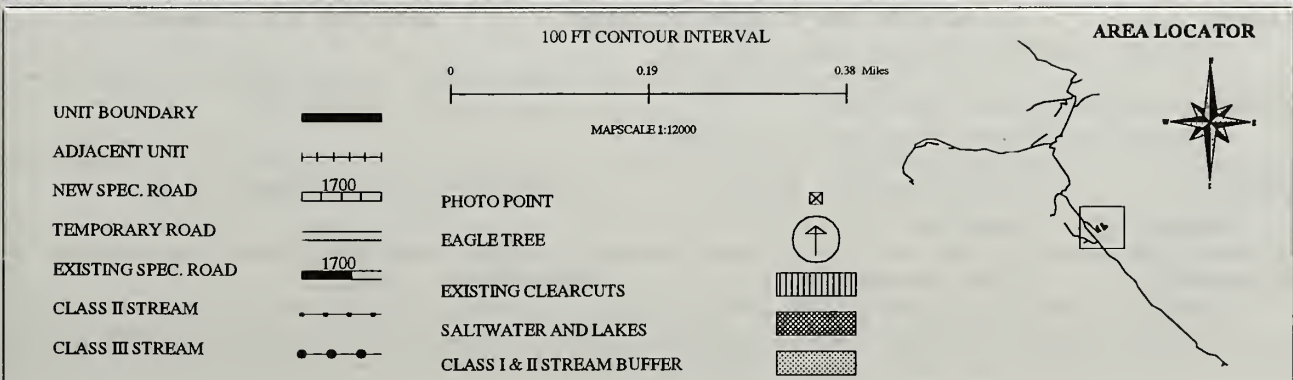
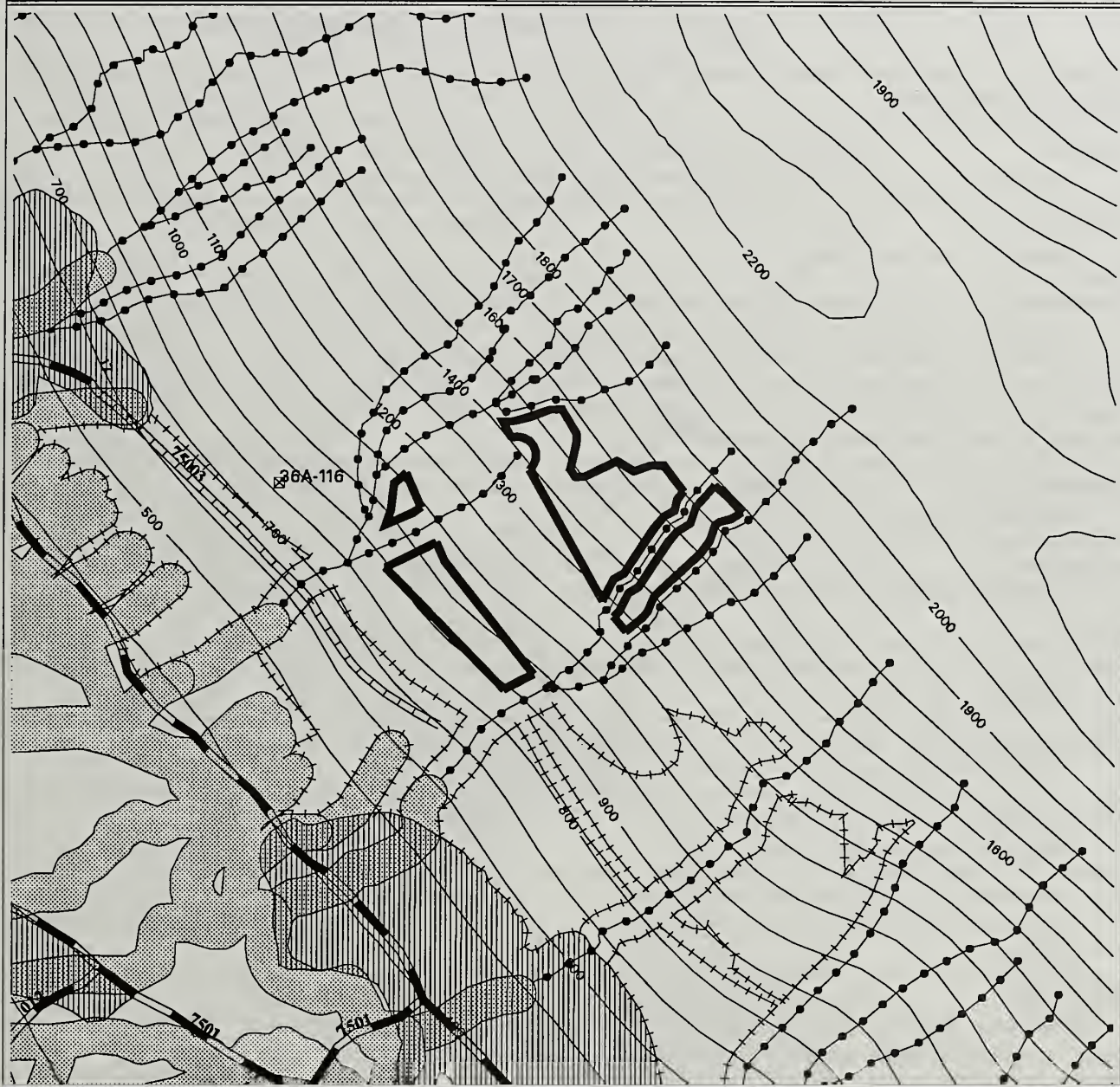
VCU: 2200
VOLUME (MBF): 408

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	35	143	Helicopter	Patch Clearcut
F	90	367	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Subalpine/alpine habitat. Low survey priority.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: See hydrology and soils for remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundaries to class III stream channels for cc w/retention alt. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate/High.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary along boundaries and class 3 channels within unit.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: Make boundary as windfirm as possible.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: Survey for herons. If active nest is located, implement W/L heron nest S&G X.A.1-3. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 4440 QUAD(s): SITD4SW
ACRES: 17 Unit 4440 Occurs in Alternatives: B F



INDIAN RIVER UNIT CARD

UNIT: 4620 VCU: 2200
ACRES: 60.9 VOLUME (MBF): 1690

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
F	80	1352	Helicopter	Overstory Removal

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants.
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY REMARKS: No concerns.
{ FISHERIES }	FIELD REVIEW: JACOBSON/KILLINGER	APPROVED BY: G.KILLINGER REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams on lower end of SE and NW boundary streams. Leave windfirm (against prevailing SE storm winds) boundary on large HC6, Category B channels on NW and SE boundaries and in middle of unit. Protect numerous Class III, Category B and C streams as per BMP 13.16.
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER REMARKS: Recommend windfirm boundaries to class II stream channels. (BMP 12.6a; 13.16).
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER REMARKS: Vulnerability risk = Moderate/High.
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL REMARKS: Recommend overstory removal > 16 inches dbh for 80% of volume; buffers on V-notches.
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN REMARKS: Recommend windfirm boundary on V-notch along southeast boundary of unit. Create windfirm leave strip along class 3 channel within unit.
{ TIMBER }	FIELD REVIEW: L.WINN, M.REGAN	APPROVED BY: M.REGAN REMARKS: Recommend helicopter harvest.
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER REMARKS: Recommend helicopter harvest.
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY REMARKS: Survey for herons. If active nest is located, implement W/L heron nest S&G X.A.1-3. When using overstory removal harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 4620 QUAD(s): SITD4SW
 ACRES: 61 Unit 4620 Occurs in Alternatives: F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 4710
ACRES: 18.7

VCU: 2200
VOLUME (MBF): 713

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
F	20	143	Shovel	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Maintain windfirmness of main channel FP4 (riparian buffer) across road from lower boundary. HC2/HC6 stream on NW boundary and AF1/HC6 stream on E boundary are class III, category C and B streams. Protect per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/High

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Mistletoe. Recommend Single Tree Selection, shovel yarding.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: Recommend shovel.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: K.RUTLEDGE APPROVED BY: L.SHIPLEY
REMARKS: Single Tree Selection will help maintain suitable habitat characteristics.

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

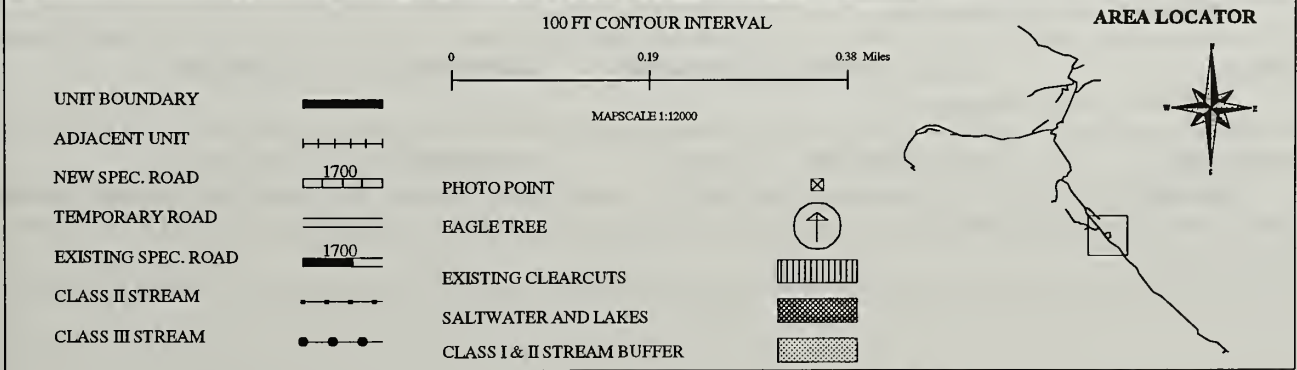
VCU: 2200

UNIT NUMBER: 4710

QUAD(s): SITD4SW

ACRES: 19

Unit 4710 Occurs in Alternatives: F



INDIAN RIVER UNIT CARD

UNIT: 4910

VCU: 2200

ACRES: 35.5

VOLUME (MBF): 943

ALTERNATIVE SUMMARY

ALTER-
NATIVE
F

PERCENT
HARVEST
90

HARVEST
VOLUME
849

HARVEST
METHOD
Helicopter

HARVEST
SYSTEM
Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Alpine/subalpine habitat; moderate survey priority. Recommend botanist present during layout.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: See soils and hydrology for remarks.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class III stream. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: No concern.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on east side of unit.

{ TIMBER } FIELD REVIEW: B.BEALL APPROVED BY: M.REGAN
REMARKS: Recommend clearcut, helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

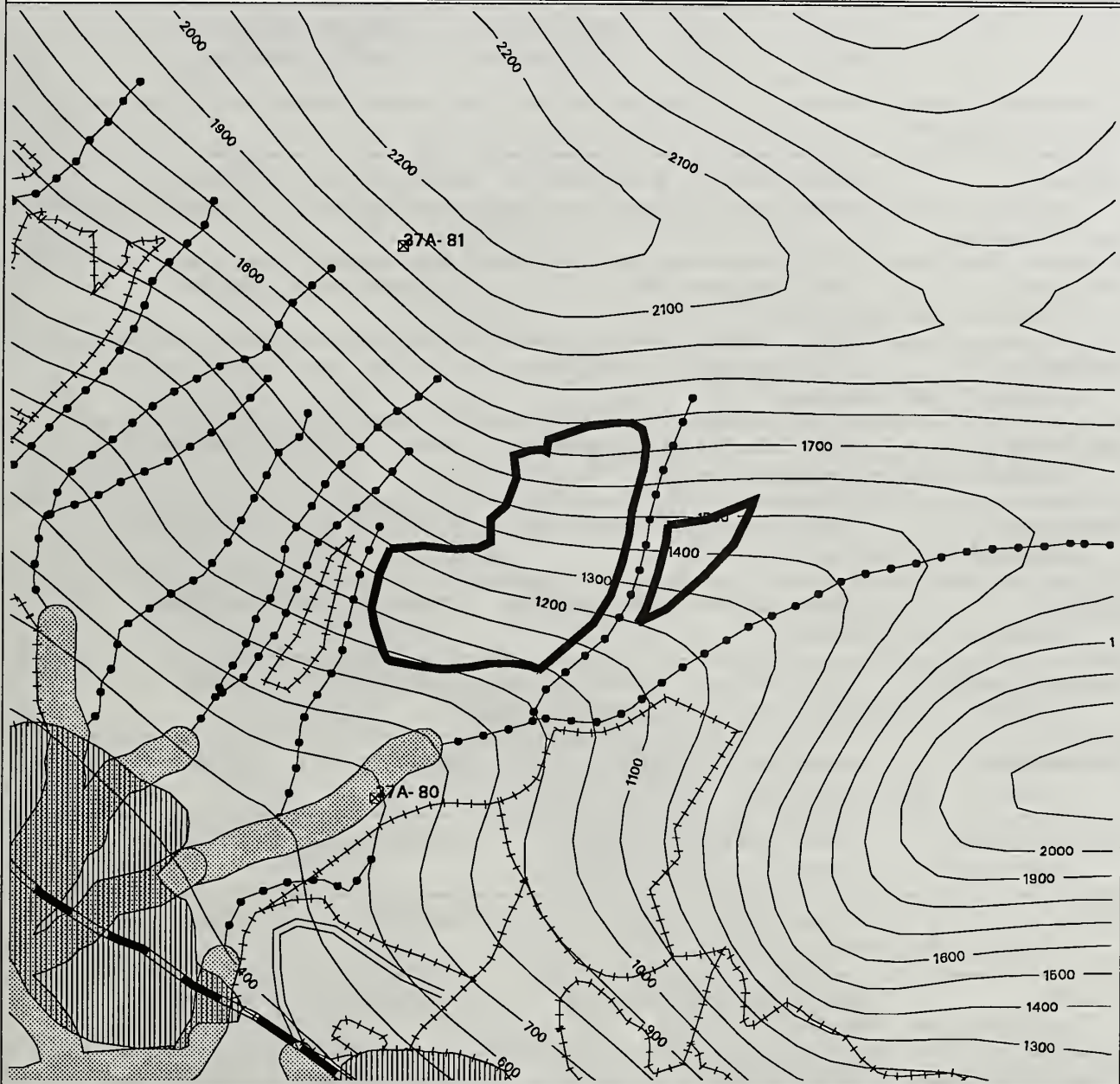
{ VISUAL } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Maintain adequate wildlife corridors along buffers and unharvested areas. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 4910 QUAD(s): SITD4SW
 ACRES: 35 Unit 4910 Occurs in Alternatives: F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 5010
ACRES: 19.3

VCU: 2200
VOLUME (MBF): 353

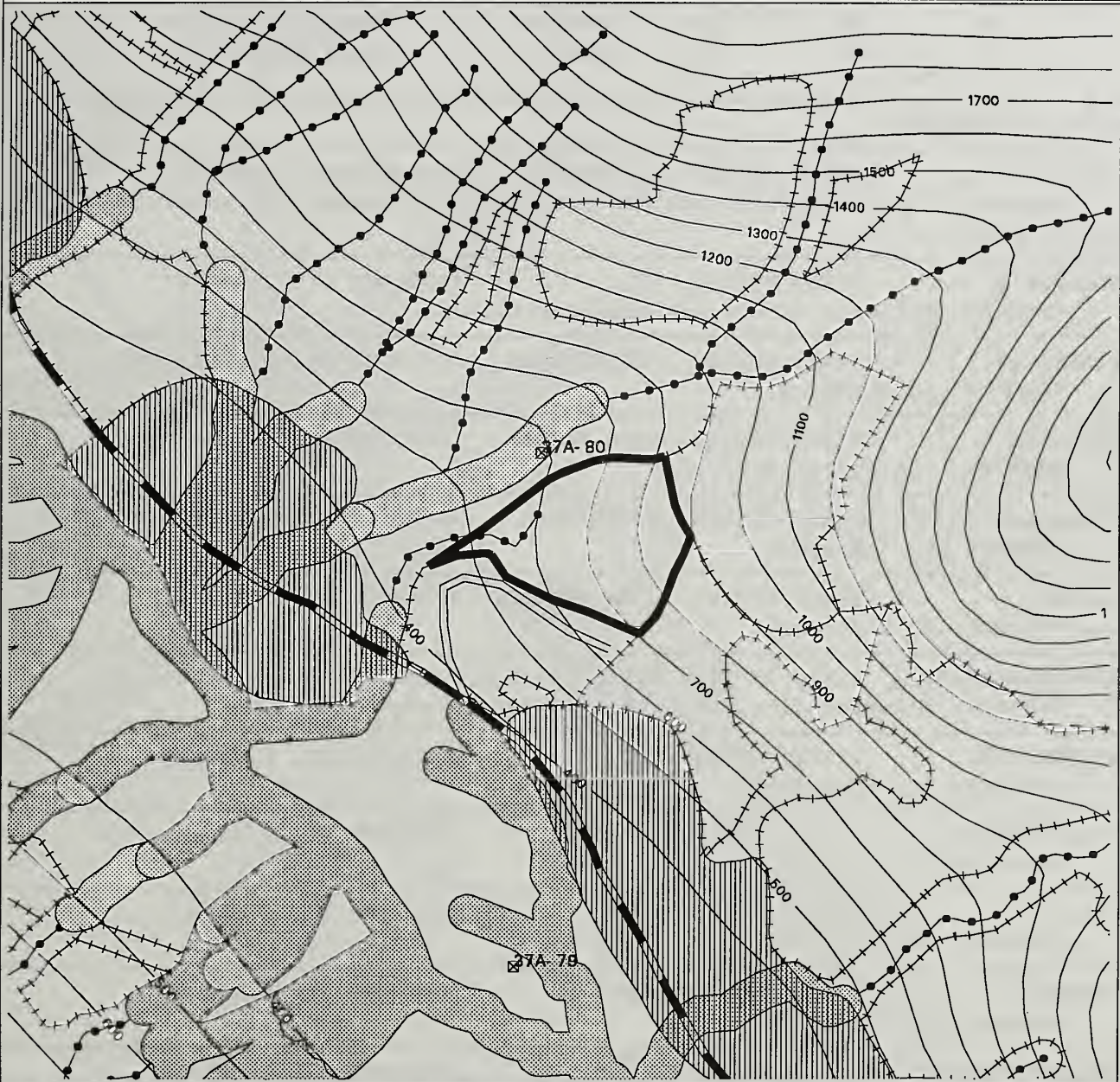
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	70	247	Helicopter	Overstory Removal
F	35	124	Helicopter	Patch Clearcut

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.SHEPHARD	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants. No sensitive plants found in survey.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: No concerns.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate/High		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: M.REGAN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns.		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 5010 QUAD(s): SITD4SW
 ACRES: 19 Unit 5010 Occurs in Alternatives: B F



100 FT CONTOUR INTERVAL

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



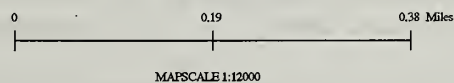
EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 5011
ACRES: 17.5

VCU: 2200
VOLUME (MBF): 458

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	70	320	Shovel	Overstory Removal
F	35	160	Shovel	Patch Clearcut

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.SHEPHARD	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants. No sensitive plants found in survey.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: No concerns.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate/High		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: M.REGAN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns.		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 5011 QUAD(s): SITD4SW
 ACRES: 18 Unit 5011 Occurs in Alternatives: B F



100 FT CONTOUR INTERVAL

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



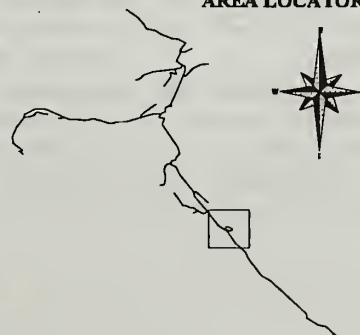
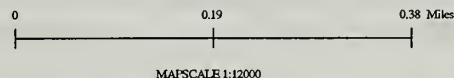
EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 5020
ACRES: 29.6

VCU: 2200
VOLUME (MBF): 392

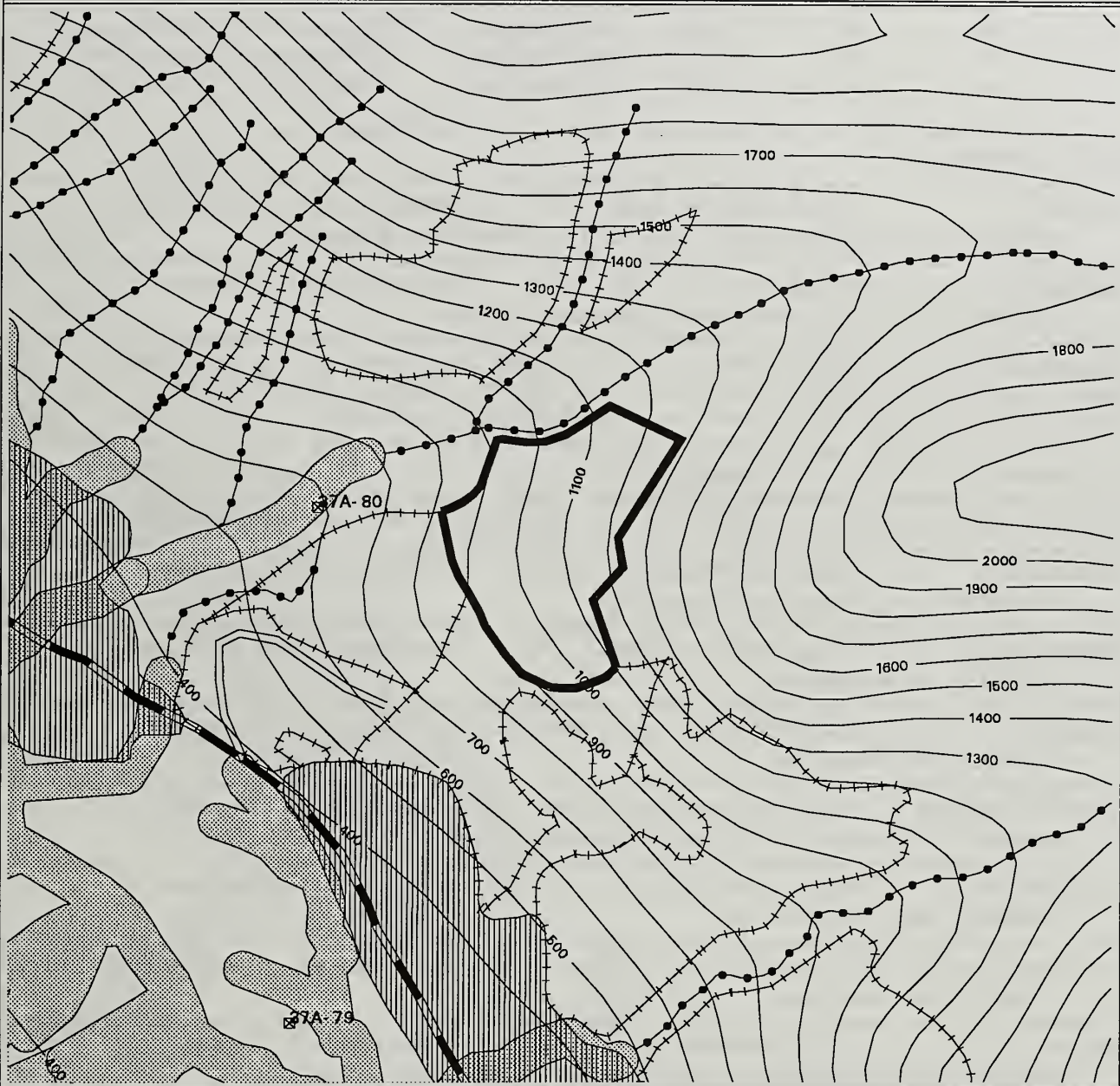
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	70	275	Helicopter	Overstory Removal
F	35	137	Helicopter	Patch Clearcut

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.SHEPHARD	APPROVED BY: S.TRULL
REMARKS: Alpine/subalpine habitat. No sensitive plants found in survey.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: See hydrology for remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class III stream for Alternative B. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: M.REGAN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: No concerns.		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 5020 QUAD(s): SITD4SW
 ACRES: 30 Unit 5020 Occurs in Alternatives: B F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



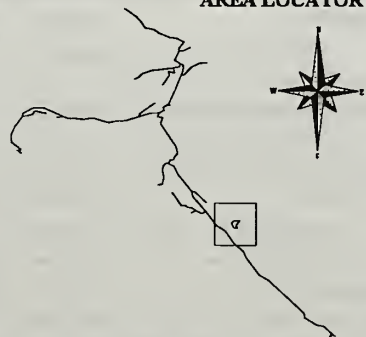
SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 5040
ACRES: 45.3

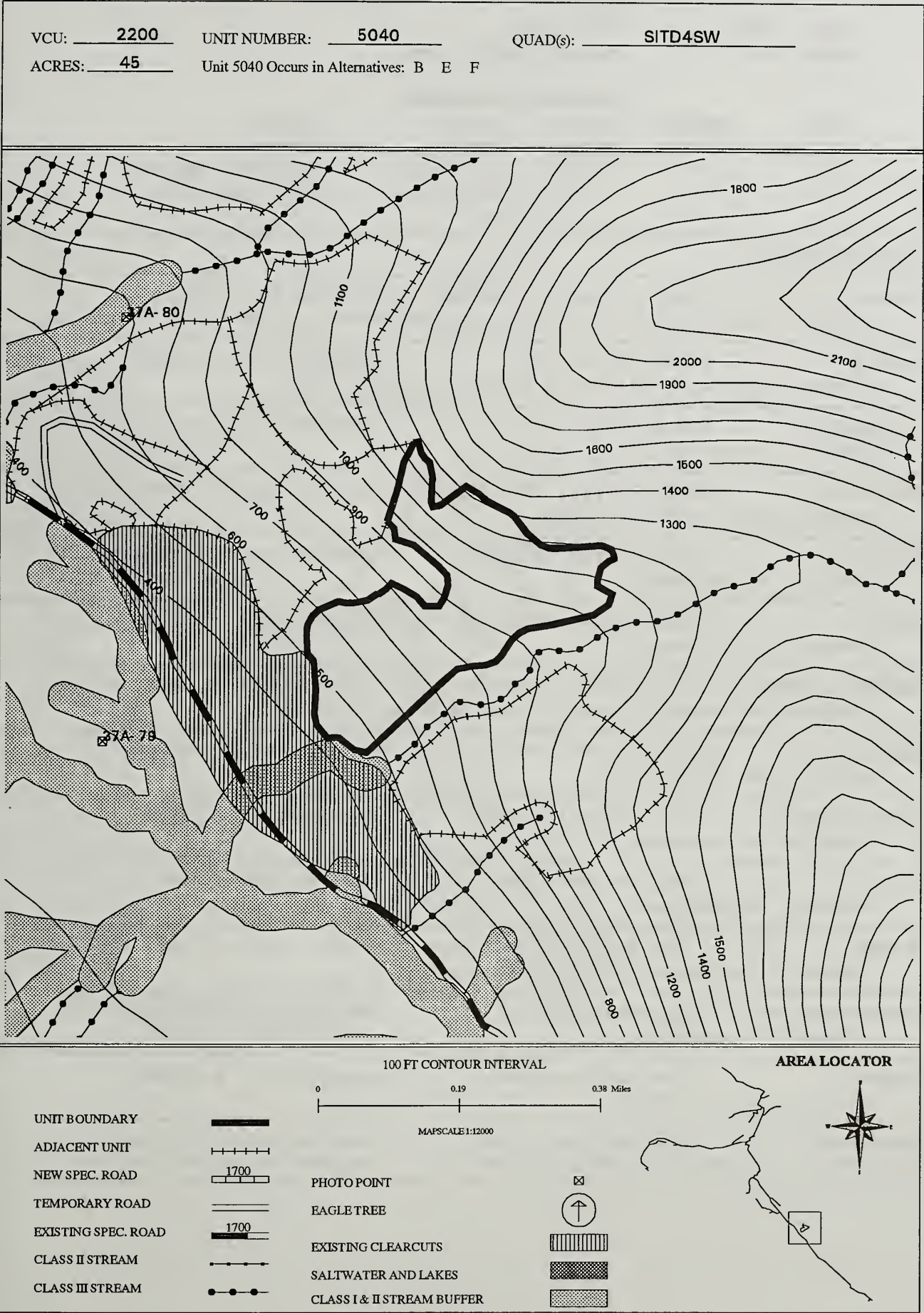
VCU: 2200
VOLUME (MBF): 812

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	731	Helicopter	Clearcut w/ retention
E	90	731	Helicopter	Clearcut w/ retention
F	90	731	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams along lower SW corner of unit. Maintain min. 100-ft buffer on Class II, Category A streams, as per BMP 12.6a. Leave windfirm boundary on deeply incised, class III, category B stream on SE boundary. Protect as per BMP 13.16 (and 13.3). Where a buffer is left along channel, recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate/High.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on south side of unit.		
{ TIMBER }	FIELD REVIEW: S.GODFREY	APPROVED BY: M.REGAN
REMARKS: Recommend clearcut, helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP



INDIAN RIVER UNIT CARD

UNIT: 5080
ACRES: 23.8

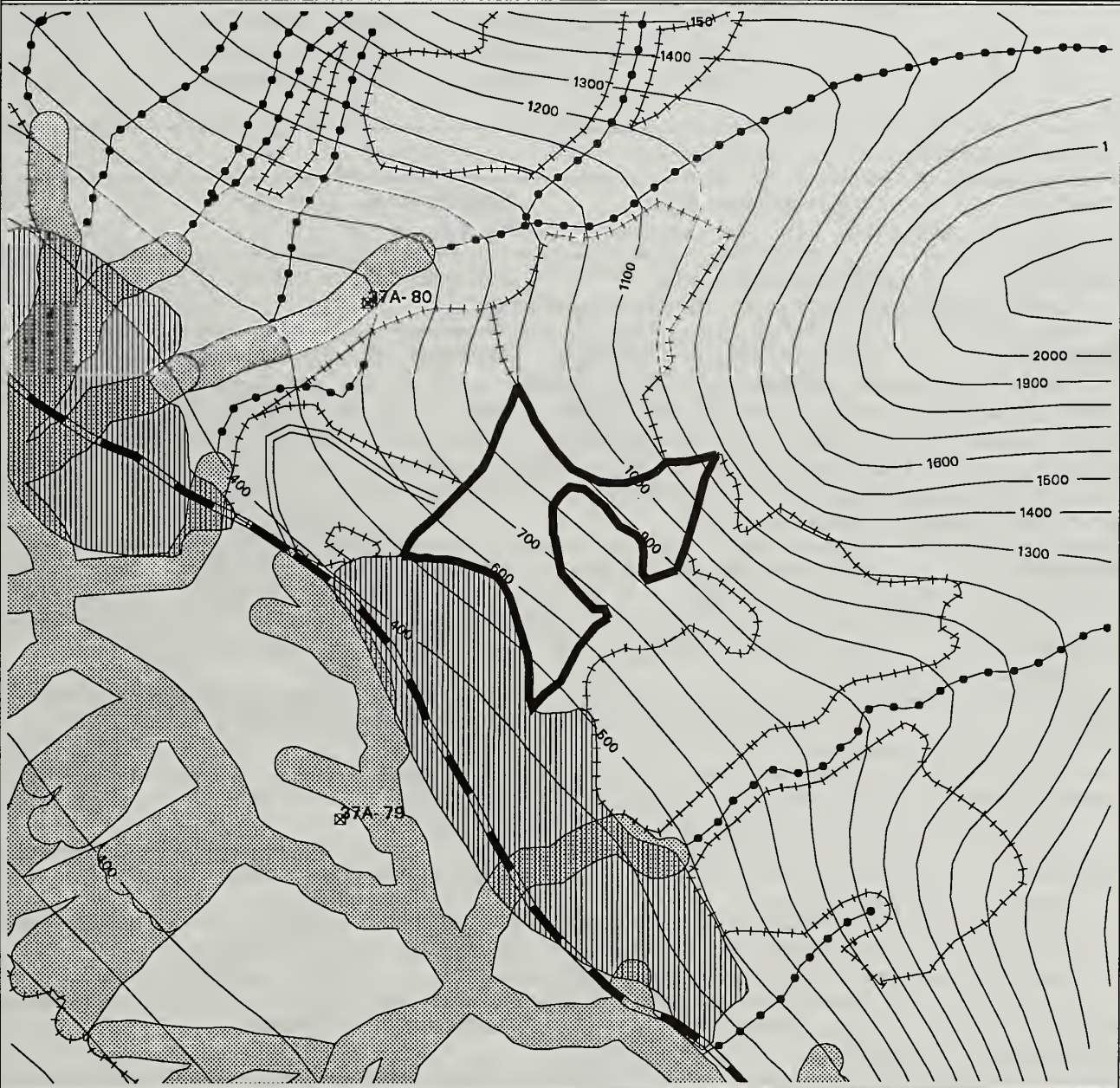
VCU: 2200
VOLUME (MBF): 395

		ALTERNATIVE SUMMARY		
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	80	316	Helicopter	Overstory Removal
F	35	138	Helicopter	Patch Clearcut

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.SHEPHARD	APPROVED BY: S.TRULL
REMARKS: Slide and swale habitat. No sensitive plants found in survey.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: No concerns.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: G.PETERSON, M.REGAN	APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: When using overstory removal harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 5080 QUAD(s): SITD4SW
ACRES: 24 Unit 5080 Occurs in Alternatives: B F



UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM



PHOTO POINT

EAGLE TREE

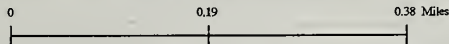
EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER



100 FT CONTOUR INTERVAL



MAP SCALE 1:12000

AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 5220

VCU: 2200

ACRES: 35.9

VOLUME (MBF): 620

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	124	Helicopter	Group Selection
E	20	124	Helicopter	Group Selection
F	35	217	Helicopter	Patch Clearcut

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Subalpine habitat; low survey priority.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a for stream at extreme NW corner. Leave windfirm boundary on deeply incised, class III, category B stream along NW/N boundary. Protect as per BMP 13.16 (and 13.3). Where a buffer is left along channel, recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate/High.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend group selection to meet wildlife objectives.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Cliffs. Recommend clearcut, helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

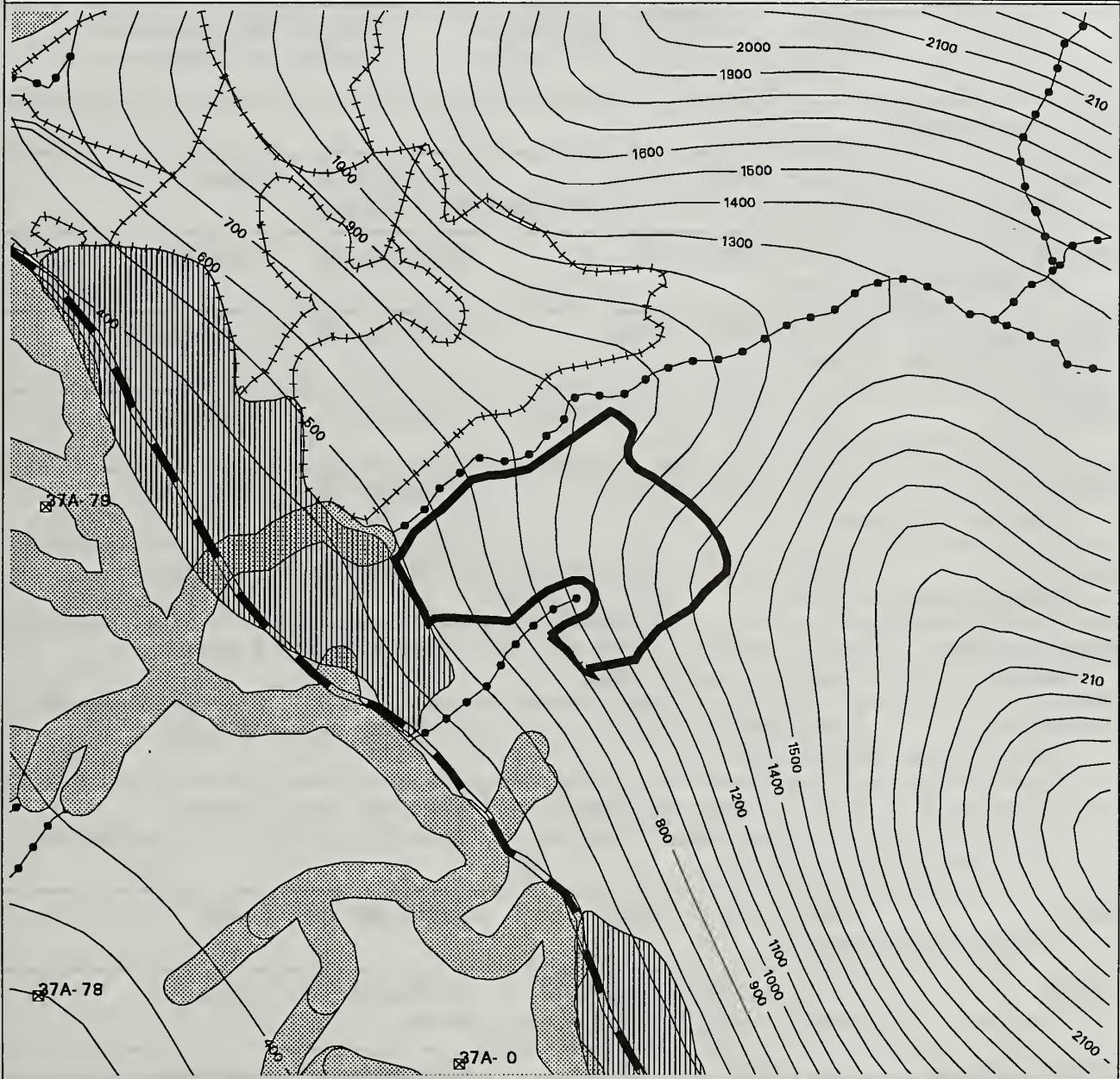
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Group selection will help maintain suitable travel corridor.

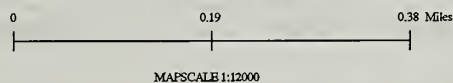
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 5220 QUAD(S): SITD4SW
 ACRES: 36 Unit 5220 Occurs in Alternatives: B E F



100 FT CONTOUR INTERVAL



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 5410 VCU: 2200
ACRES: 19.5 VOLUME (MBF): 334

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
E	90	301	Helicopter	Clearcut w/ retention
F	90	301	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: No concerns.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Blowdown. Recommend clearcut, or group selection, or Single Tree Selection. Helicopter harvest.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: S.GODFREY	APPROVED BY: M.REGAN
REMARKS: Recommend clearcut, helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 5410 QUAD(s): SITD4SW
 ACRES: 20 Unit 5410 Occurs in Alternatives: E F



100 FT CONTOUR INTERVAL

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



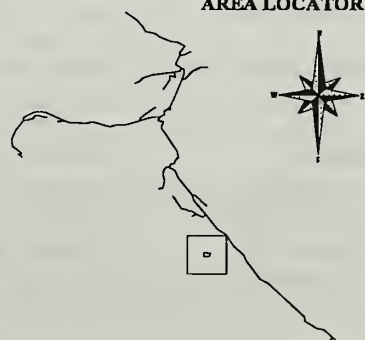
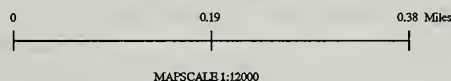
EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 5840

VCU: 2200

ACRES: 2.7

VOLUME (MBF): 76

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	70	53	Helicopter	Overstory Removal
F	70	73	Helicopter	Overstory Removal

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: See soils and hydrology for remarks.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to west side class III stream.
(BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Blowdown, mistletoe, oversteepened, regeneration, V-notches.
Recommend helicopter harvest, overstory removal > 16 inches dbh due to old blowdown and good regeneration in the unit. Intent is to maintain root strength by leaving green trees in the unit.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

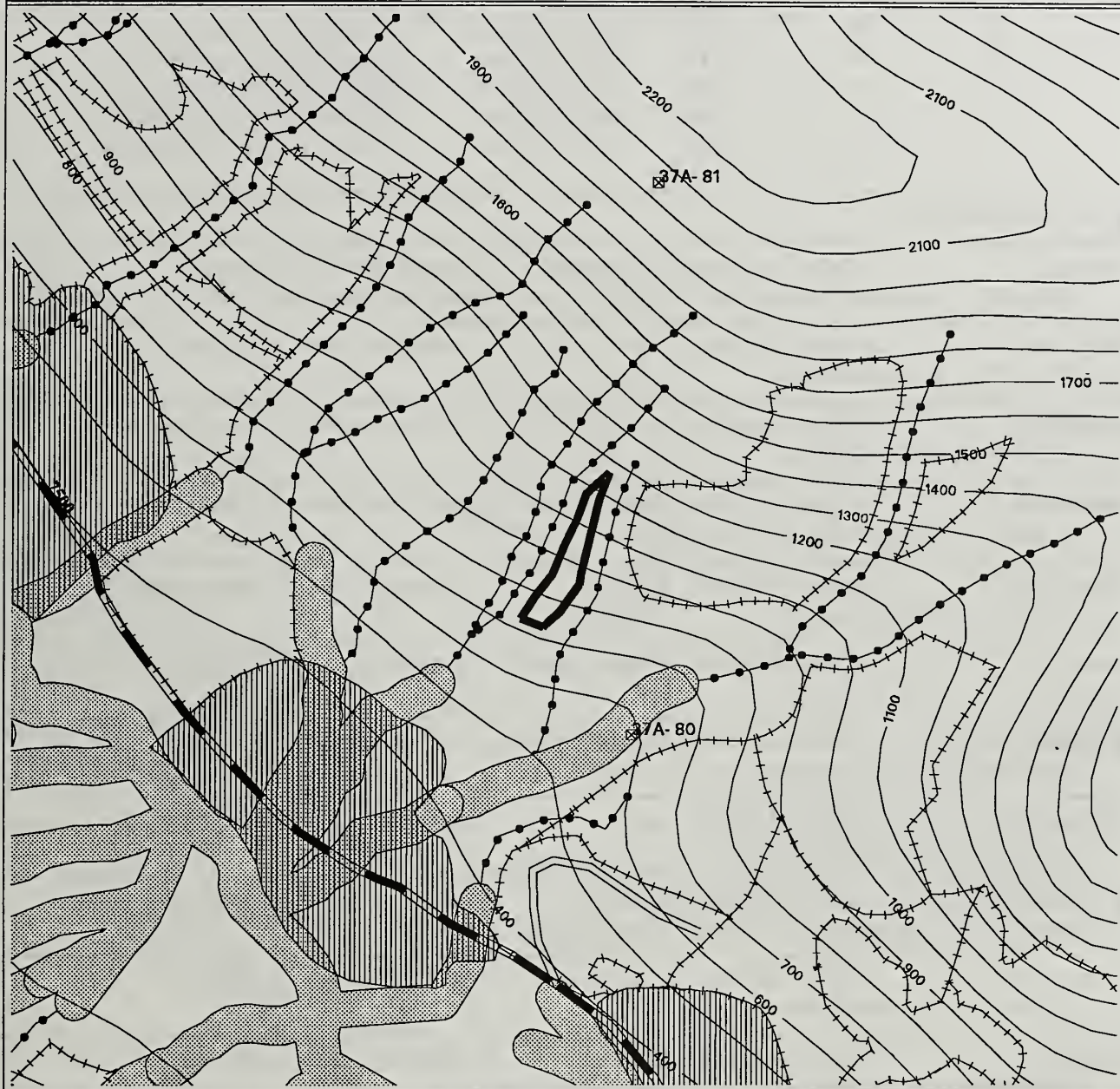
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: No concerns.

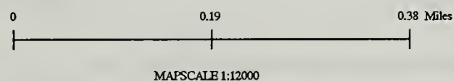
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 5840 QUAD(s): SITD4SW
 ACRES: 3 Unit 5840 Occurs in Alternatives: B F



100 FT CONTOUR INTERVAL



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 20510
ACRES: 16.6

VCU: 2221
VOLUME (MBF): 268

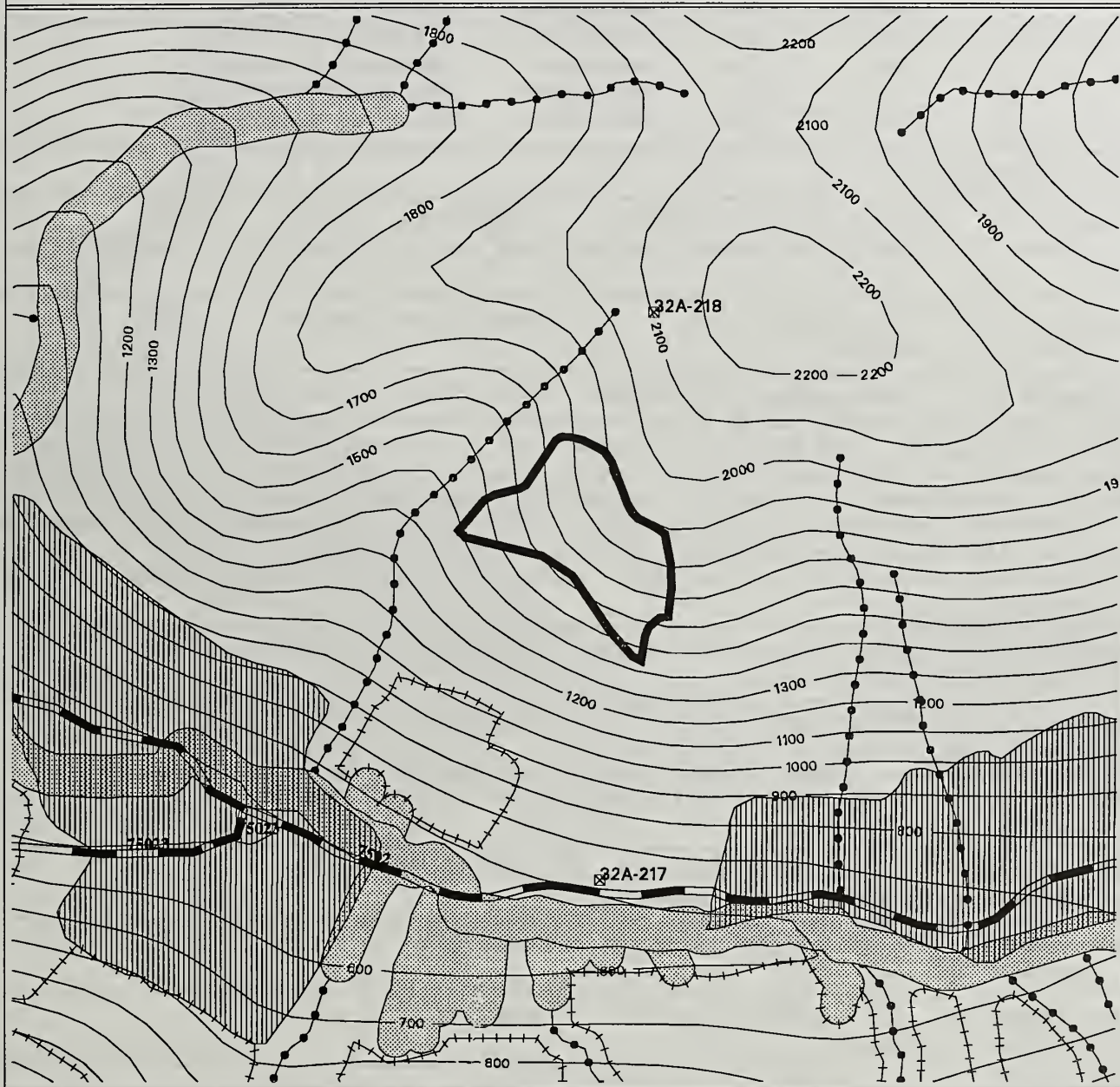
		ALTERNATIVE SUMMARY		
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	241	Helicopter	Clearcut w/ retention
C	90	241	Helicopter	Clearcut w/ retention
D	90	241	Helicopter	Clearcut w/ retention
E	90	241	Helicopter	Clearcut w/ retention
F	90	241	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.SHEPHARD	APPROVED BY: S.TRULL
REMARKS: Alpine/subalpine habitat. No sensitive plants found in survey.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: No concerns.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut, helicopter yarding.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 20510 QUAD(s): SITD5NE
 ACRES: 17 Unit 20510 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

AREA LOCATOR

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

INDIAN RIVER UNIT CARD

UNIT: 20610

VCU: 2221

ACRES: 13.7

VOLUME (MBF): 237

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	80	190	Helicopter	Overstory Removal
C	80	190	Helicopter	Overstory Removal
D	80	190	Helicopter	Overstory Removal
E	80	190	Helicopter	Overstory Removal
F	80	190	Helicopter	Overstory Removal

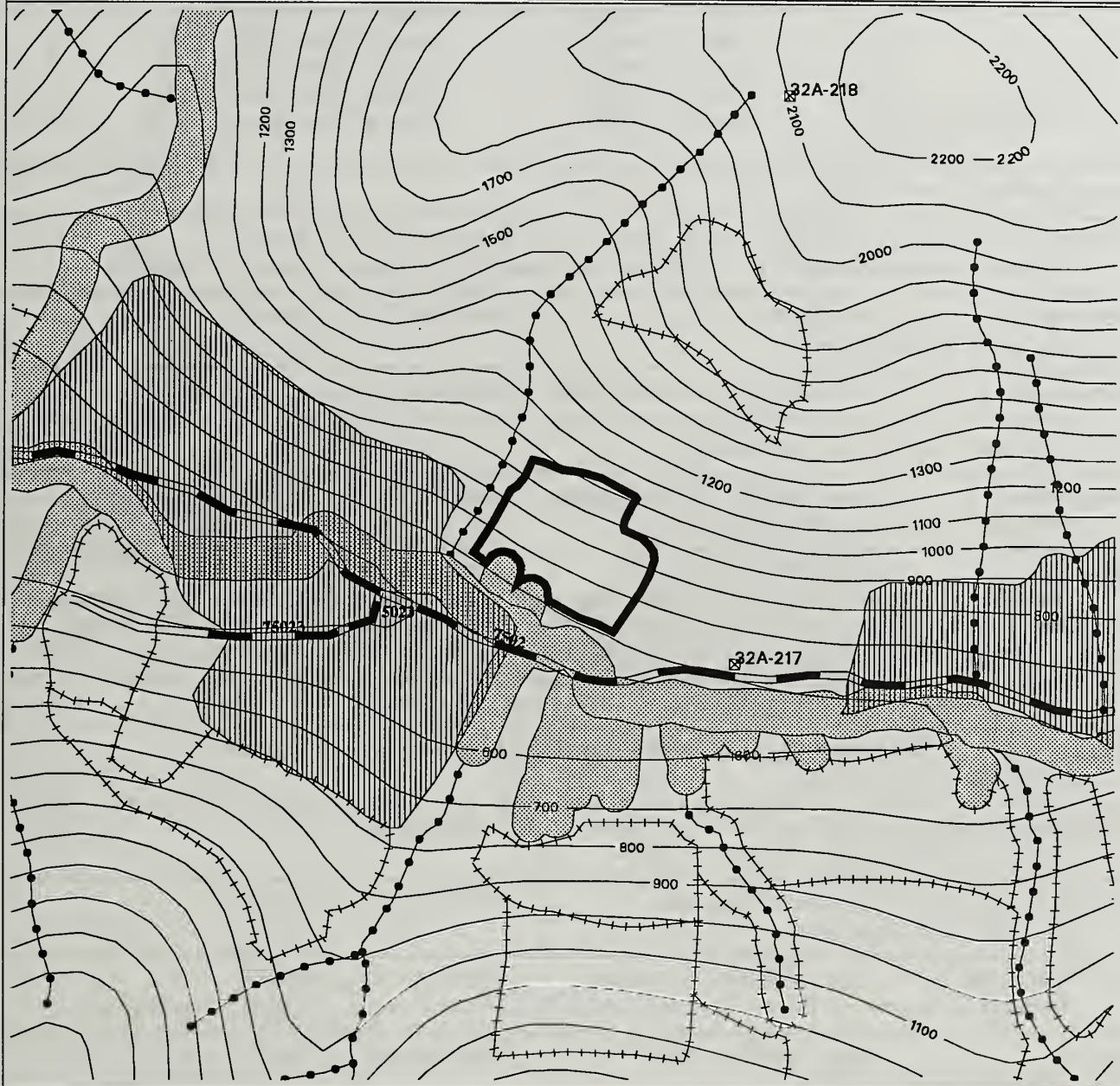
REVIEW INFORMATION

{ BOTANY }	FIELD REVIEW: M.SHEPHARD	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants. No sensitive plants found in survey.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams in lower SW of unit; Maintain min. 100-ft buffer on Class II, Category A streams (BMP 12.6a). Existing blowdown along HC6 channel on W boundary is a concern. Leave windfirm boundary along this class III, category B stream, and protect per BMP 13.16 (and 13.3). Recommend removing all large trees and leaving smaller ones along the HC6 channel to maintain a windfirm stream bank. Deeply incised, class III channel in middle of unit (one of the two that are class II in lower end of unit) is a category B stream. Protect per BMP 13.16 (and 13.3).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using overstory removal harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 20610 QUAD(s): SITD5NE
 ACRES: 14 Unit 20610 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles
 MAP SCALE 1:12000

UNIT BOUNDARY
 ADJACENT UNIT
 NEW SPEC. ROAD
 TEMPORARY ROAD
 EXISTING SPEC. ROAD
 CLASS II STREAM
 CLASS III STREAM

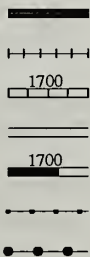
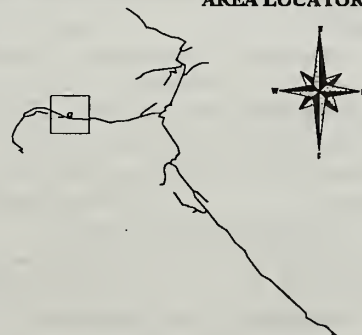


PHOTO POINT
 EAGLE TREE
 EXISTING CLEARCUTS
 SALTWATER AND LAKES
 CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 20710

VCU: 2221

ACRES: 10.7

VOLUME (MBF): 86

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	43	Cable	Single Tree Selection
C	50	43	Cable	Single Tree Selection
D	50	43	Cable	Single Tree Selection
E	50	81	Cable	Single Tree Selection
F	50	43	Cable	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPARD APPROVED BY: S.TRULL
REMARKS: Alpine/subalpine habitat. No sensitive plants found in survey.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: HC3 channel on E is category B stream. Protect as per BMP 13.16 (and 13.3), and Leave windfirm boundary .

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to east side stream to protect from northwest wind. (BMP 12.6a; 13.16). Windfirm boundaries can be established by feathering buffer or harvesting trees with 1/3 or more of length above slope break to stream channel. Existing windthrow in the ten-mile drainage has been caused by severe northwesterly winds. The mouth of valley on Tenakee Inlet is exposed to southeasterly winds.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend cable system, individual tree, with partial suspension.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: Recommend shovel yarding, where feasible.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

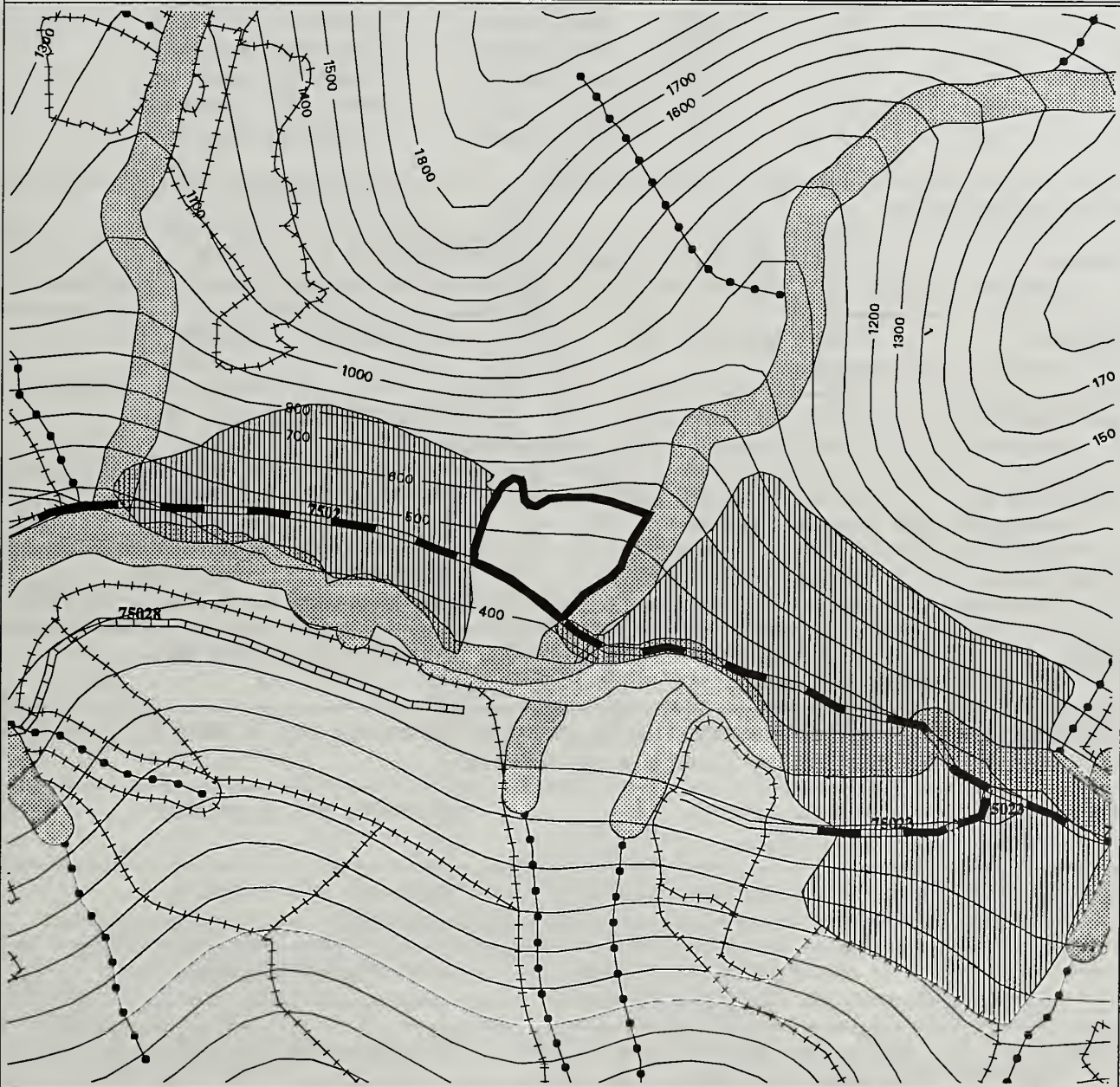
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: No concerns.

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 20710 QUAD(s): SITD5NE
 ACRES: 11 Unit 20710 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



Printed 08/25/97

INDIAN RIVER UNIT CARD

UNIT: 20810
ACRES: 21.8

VCU: 2221
VOLUME (MBF): 351

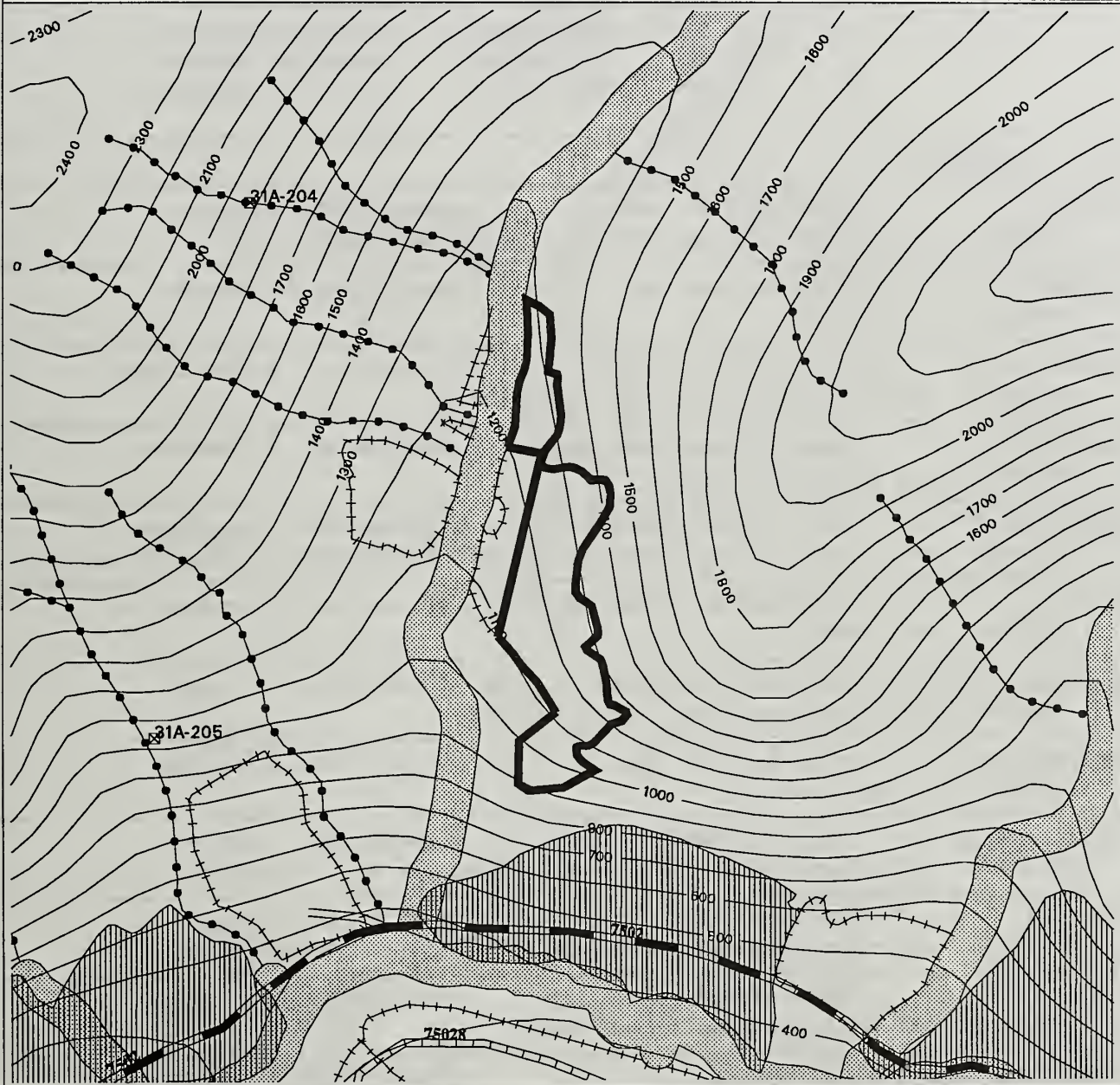
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	70	246	Helicopter	Overstory Removal
C	70	246	Helicopter	Overstory Removal
D	70	246	Helicopter	Overstory Removal
E	80	281	Helicopter	Overstory Removal
F	80	281	Helicopter	Overstory Removal

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.SHEPHARD	APPROVED BY: S.TRULL
REMARKS: Alpine/subalpine habitat. No sensitive plants found in survey.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: See hydrology and soils for remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a; 13.16. Recommend windfirm boundary to class II streams.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend overstory removal >18 inches dbh, helicopter yarding.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Recommend windfirm boundary along stream on west side.		
{ TIMBER }	FIELD REVIEW: J.STELICK	APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: When using overstory removal harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

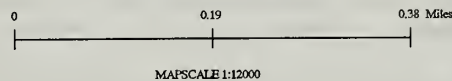
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 20810 QUAD(s): SITD5NE
 ACRES: 22 Unit 20810 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

AREA LOCATOR



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 20812
ACRES: 4.6

VCU: 2221
VOLUME (MBF): 84

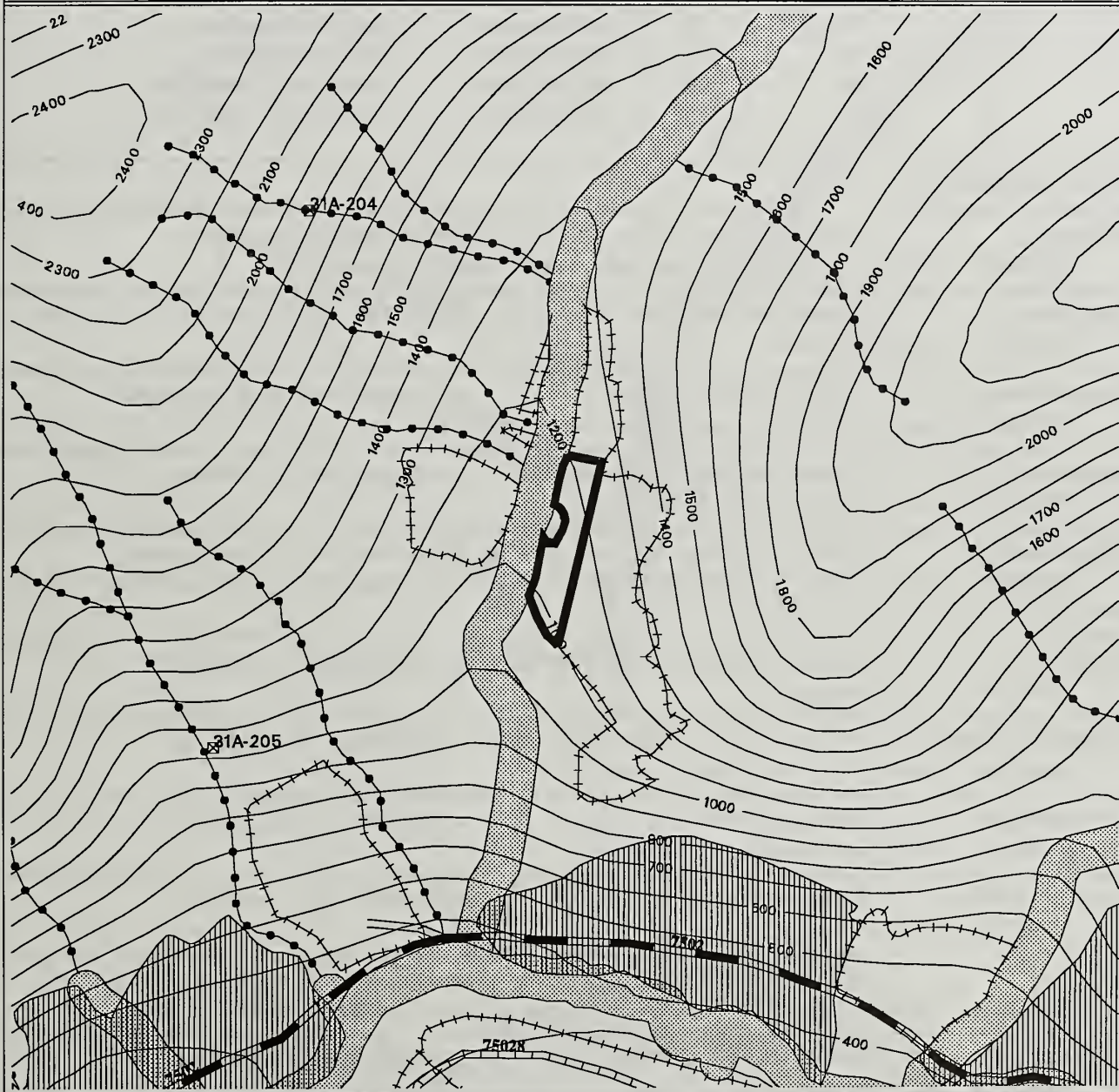
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	70	59	Helicopter	Overstory Removal
D	70	59	Helicopter	Overstory Removal
F	80	67	Helicopter	Overstory Removal

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: See hydrology and soils for remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a; 13.16. Recommend windfirm boundary to class II stream.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend overstory removal >18 inches dbh, helicopter yarding.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Recommend windfirm boundary along stream on west side.		
{ TIMBER }	FIELD REVIEW: J.STELICK	APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: When using overstory removal harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 20812 QUAD(S): SITD5NE
ACRES: 5 Unit 20812 Occurs in Alternatives: C D F



100 FT CONTOUR INTERVAL

AREA LOCATOR

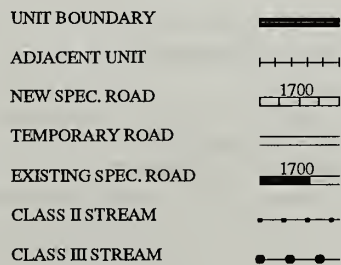


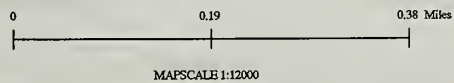
PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 20910
ACRES: 8.5

VCU: 2221
VOLUME (MBF): 112

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	50	56	Helicopter	Patch Clearcut
D	50	56	Helicopter	Patch Clearcut
E	80	90	Helicopter	Overstory Removal
F	80	90	Helicopter	Overstory Removal

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Alpine/subalpine habitat. Low survey priority.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: See hydrology and soils for remarks.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a; 13.16. Recommend windfirm boundary to east side class II stream.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: No concerns.

{ **SOILS** } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary along stream on east side of unit.

{ **TIMBER** } FIELD REVIEW: NONE APPROVED BY: M.REGAN
REMARKS: No concerns.

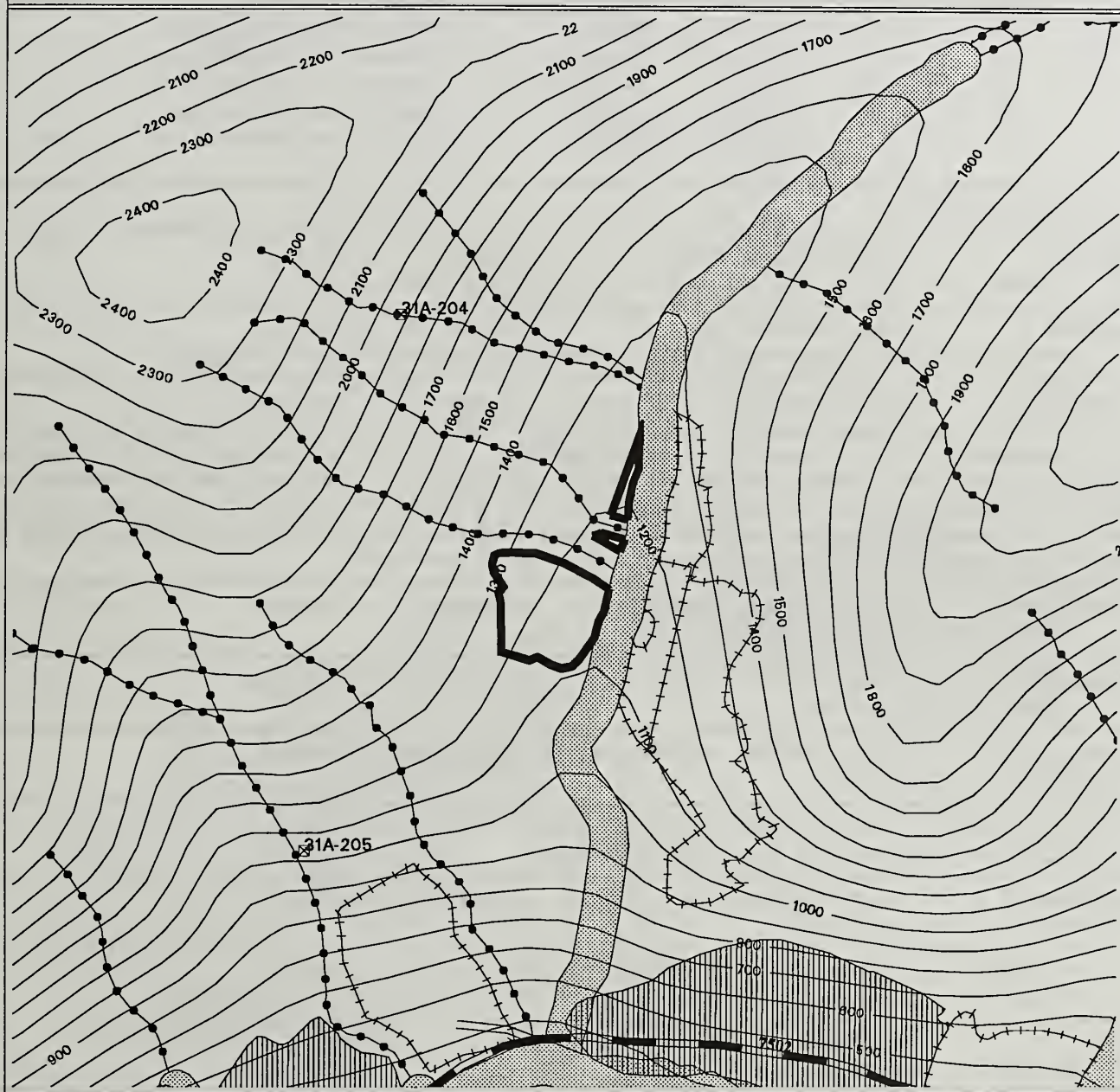
{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: When using overstory removal harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 20910 QUAD(s): SITD5NE
ACRES: 8 Unit 20910 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 21010

VCU: 2221

ACRES: 16.1

VOLUME (MBF): 466

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	233	Cable	Single Tree Selection
C	90	419	Cable	Clearcut w/ retention
D	90	419	Cable	Clearcut w/ retention
E	50	233	Cable	Single Tree Selection
F	50	233	Cable	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors. Recommend cable yarding.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams in lower SW boundary. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a (AF2 channel). Upstream, the HC6 channel is class III, category B, as is the HC6 channel on the E boundary. Protect as per BMP 13.16 (and 13.3). Existing blowdown and unstable banks along the west boundary HC6/AF2 channel is a concern. Leave windfirm boundary along both W and E boundaries.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: No concerns. Alts C and D, plant spruce on lower flat portions.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

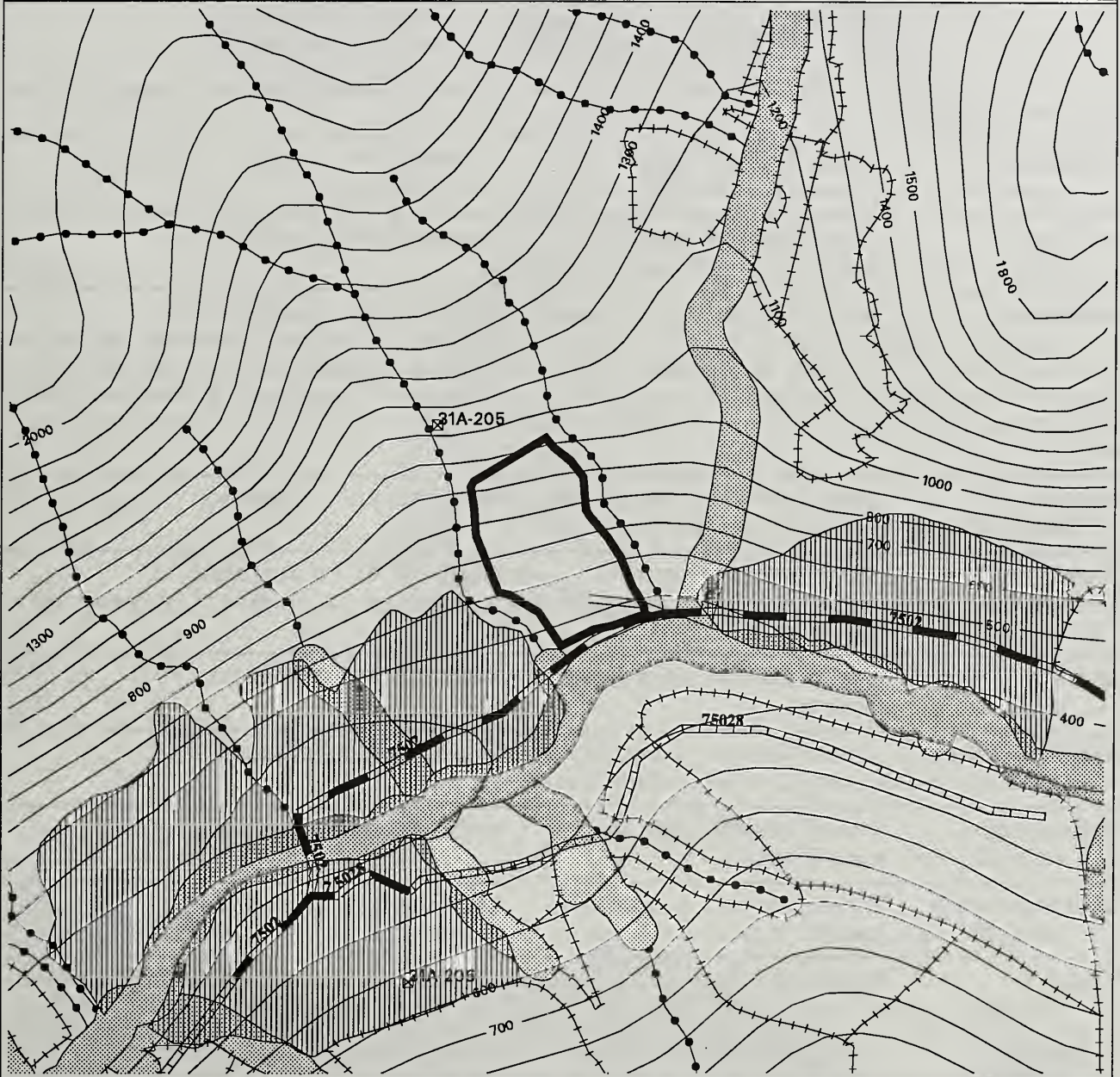
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Red-tail hawk seen in unit. Survey as funding allows. If active nest is located, implement W/L raptor nest S&G X.A.1-3. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21010 QUAD(s): SITD5NE
 ACRES: 16 Unit 21010 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles
 MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



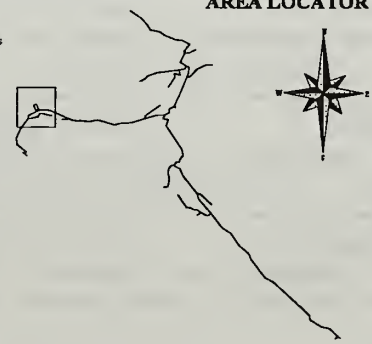
SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 21310
ACRES: 11.0

VCU: 2221
VOLUME (MBF): 319

		ALTERNATIVE SUMMARY		
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	159	Helicopter	Overstory Removal
F	35	112	Helicopter	Patch Clearcut

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Deeply incised main LC2 channel is class I. Maintain minimum of 100-ft buffer on Class I, Category A streams, as per BMP 12.6a. Deeply incised HC6 channel on N boundary and smaller channel on S boundary are class III, category B streams. Protect as per BMP 13.16 (and 13.3). Old blowdown present along HC6 channel. Leave windfirm boundary .		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Implement BMPs. Recommend windfirm boundary to class III streams. BMP 12.6a; 13.16.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate/High.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend overstory removal > 18 inches dbh.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on north and south sides of unit.		
{ TIMBER }	FIELD REVIEW: S.GODFREY	APPROVED BY: M.REGAN
REMARKS: Recommend clearcut.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: Recommend group selection to maintain visual objectives from Tenakee Inlet. LA to assist in unit layout.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns.		

VCU: 2221 UNIT NUMBER: 21310 QUAD(s): SITD5NE
ACRES: 11 Unit 21310 Occurs in Alternatives: B F

100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR

INDIAN RIVER UNIT CARD

UNIT: 21410
ACRES: 25.1

VCU: 2221
VOLUME (MBF): 727

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	145	Cable	Patch Clearcut
C	35	254	Helicopter	Patch Clearcut
D	35	254	Helicopter	Patch Clearcut
F	35	254	Helicopter	Patch Clearcut

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: The lower end of NE boundary stream is class II. Main channel MM2/LC2 stream is class I. Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams near lower NW boundary. Maintain minimum of 100-ft buffer on Class I and II, Category A streams, as per BMP 12.6a. Deeply incised HC6 channels on SW and NE boundaries are class III, category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary on HC6 streams.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Recommend partial suspension. Leave windfirm boundary on south side.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

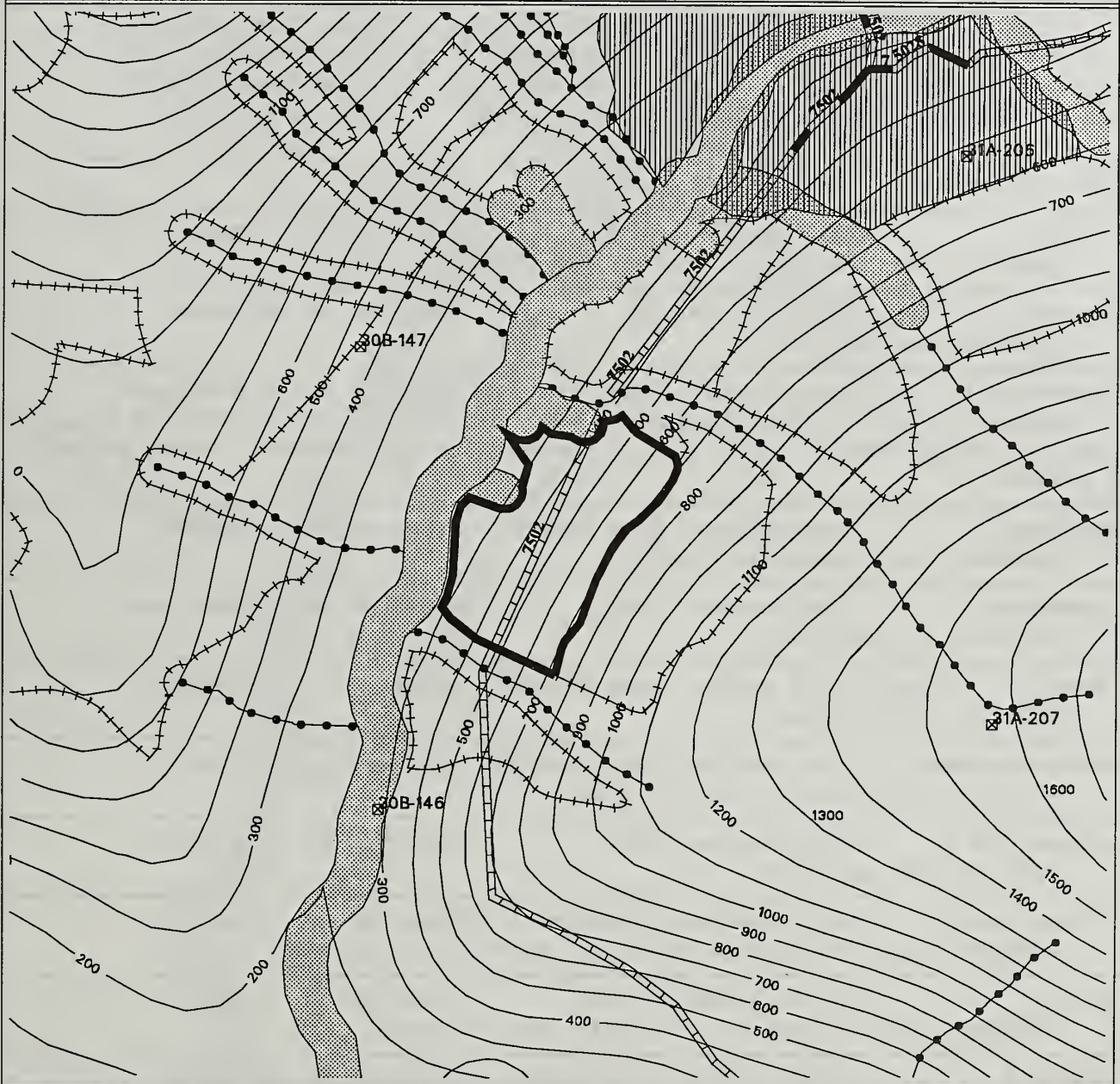
{ VISUAL } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG
REMARKS: Recommend group selections in southern half of unit to meet visual objectives. LA to assist in unit layout.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Group selections will help maintain suitable travel corridor.

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21410 QUAD(s): SITD5NE
 ACRES: 25 Unit 21410 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



Plotted 08/25/97

INDIAN RIVER UNIT CARD

UNIT: 21420

VCU: 2221

ACRES: 25.0

VOLUME (MBF): 723

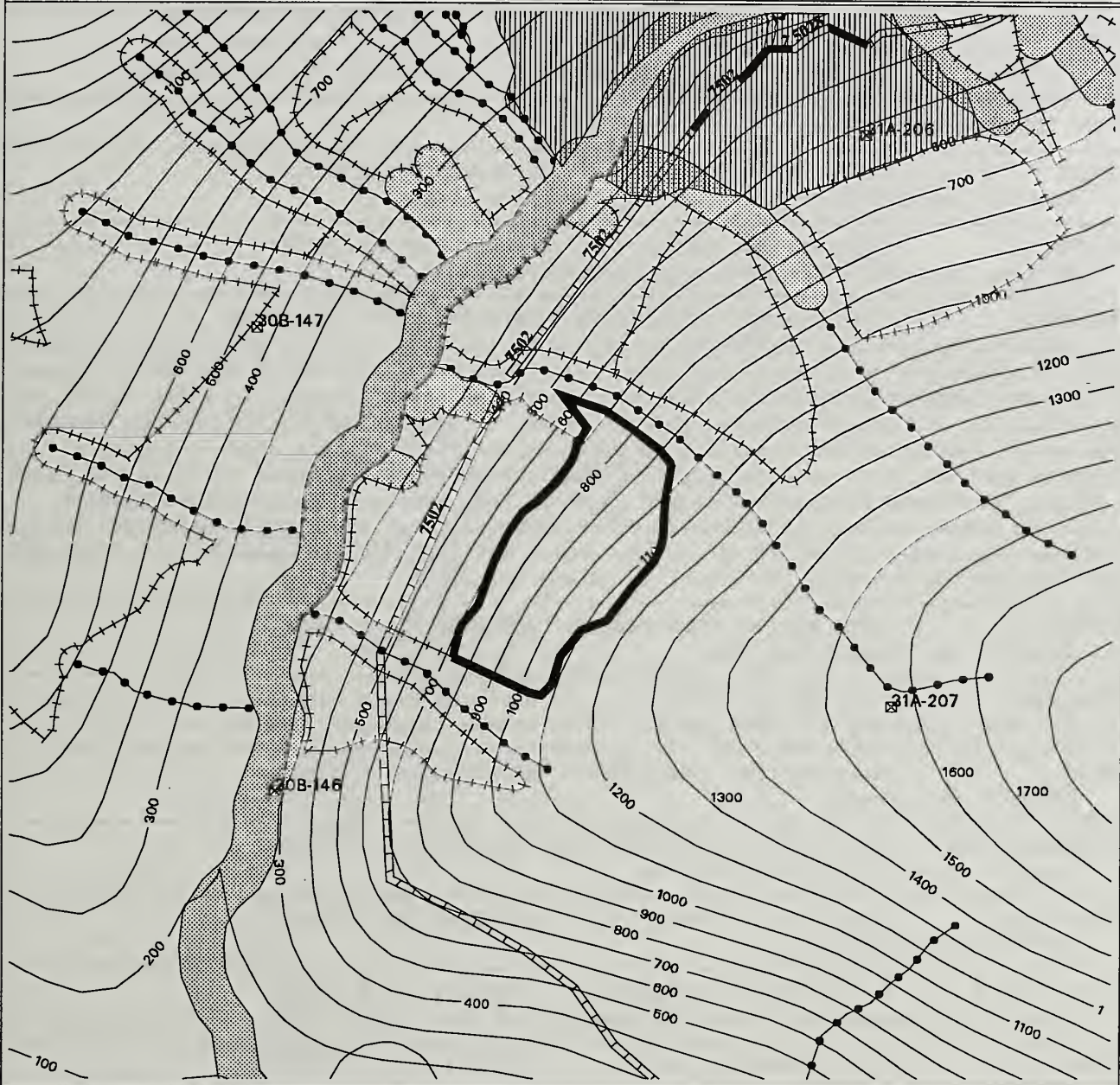
		ALTERNATIVE SUMMARY		
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	145	Helicopter	Group Selection
C	35	253	Helicopter	Patch Clearcut
D	35	253	Helicopter	Patch Clearcut
F	35	253	Helicopter	Patch Clearcut

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: Protect identified class III, category B, HC6 streams on NE and SW boundaries as per BMP 13.16 (and 13.3). Leave windfirm boundary . Also see soils for remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend group selection or overstory removal.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Partial harvest to retain root strength.		
{ TIMBER }	FIELD REVIEW: S.GODFREY	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: Recommend group selection on southern half of unit to maintain visual objectives.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns.		

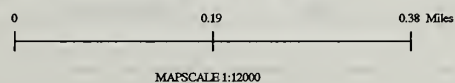
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21420 QUAD(s): SITD5NE
 ACRES: 25 Unit 21420 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL



AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 21511
ACRES: 17.6

VCU: 2221
VOLUME (MBF): 509

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	102	Cable	Patch Clearcut
C	90	458	Cable	Clearcut w/ retention
D	90	458	Cable	Clearcut w/ retention
F	90	458	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including valley bottom MM2 (class I) and smaller class I/II streams along lower boundary about up to road. Maintain minimum of 100-ft buffer on Class I and II, Category A streams, as per BMP 12.6a. Deeply incised HC2 and HC6 channels on NE and SW boundaries are class III upstream of the road. Protect these category B streams as per BMP 13.16 (and 13.3). Leave windfirm boundary on these channels and lower MM2 stream. Recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability that they will remain windfirm, along MM2 buffer and lower, class II buffers. Recommend placing unit boundary at or above slope break of Class III channels (2/3 rule) on SW HC6 channel.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundaries to stream channels. BMP 12.6a; 13.16.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention on part of unit that can be cable yarded.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on southwest side of unit.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

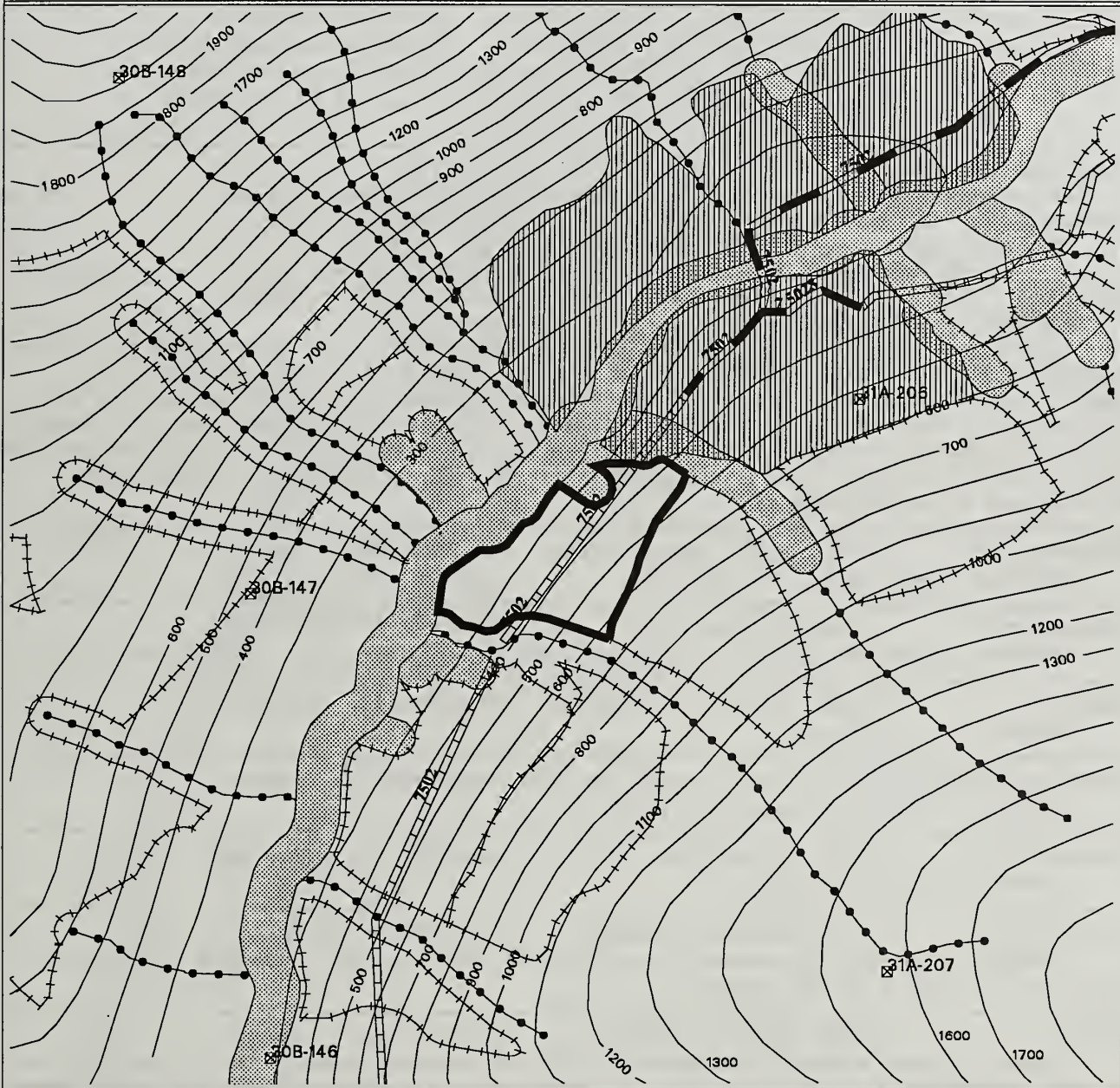
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21511 QUAD(s): SITD5NE
 ACRES: 18 Unit 21511 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 21520
ACRES: 23.5

VCU: 2221
VOLUME (MBF): 679

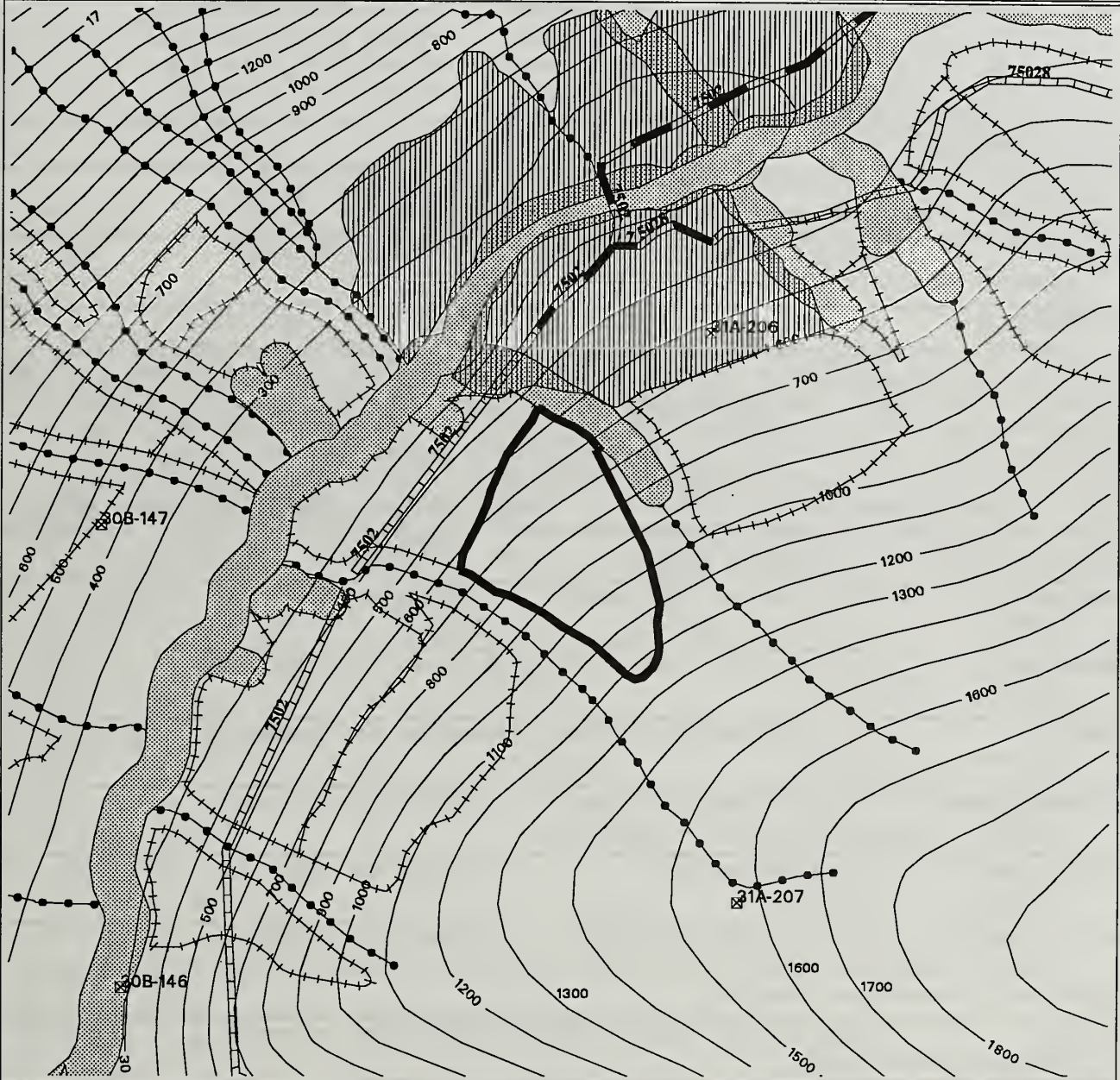
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	339	Helicopter	Overstory Removal
C	90	611	Helicopter	Clearcut w/ retention
D	90	611	Helicopter	Clearcut w/ retention
F	90	611	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: Protect class III, category B HC2 and HC6 streams on NE and SW boundaries and a small v-notch stream in the NE quadrant per BMP 13.16 (and 13.3). Leave windfirm boundary; recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer on NE HC2 channel to increase probability of remaining windfirm. Also, see hydrology and soils for remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundaries to stream channels. BMP 12.6a; 13.16.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Blowdown. Recommend clearcut with retention or overstory removal >16 inches dbh for 60% - 70% of volume.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on class 3 channel on southwest corner of unit.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Buffers and unharvested areas will provide suitable travel corridors. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21520 QUAD(s): SITD5NE
 ACRES: 23 Unit 21520 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



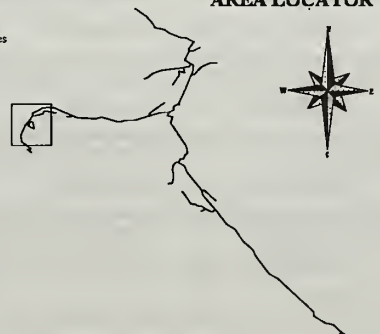
SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 21610

VCU: 2221

ACRES: 28.0

VOLUME (MBF): 771

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	40	308	Helicopter	Single Tree Selection
C	40	308	Helicopter	Single Tree Selection
D	40	308	Helicopter	Single Tree Selection
E	20	154	Helicopter	Single Tree Selection
F	40	308	Helicopter	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of category A fish streams (class II) along W and NE boundaries of both blocks. These include HC2 channel on W boundary and two FSO channels on either side of the smaller NE block. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a. Incised HC6 channel on W boundary and smaller channels between blocks and on E side of smaller block are category B streams, where they become class III upstream of class II habitat. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary; recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability that they will remain windfirm (on class II buffers).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/High

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend group selection or Single Tree Selection for 40% or less of volume due to windthrow concerns.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

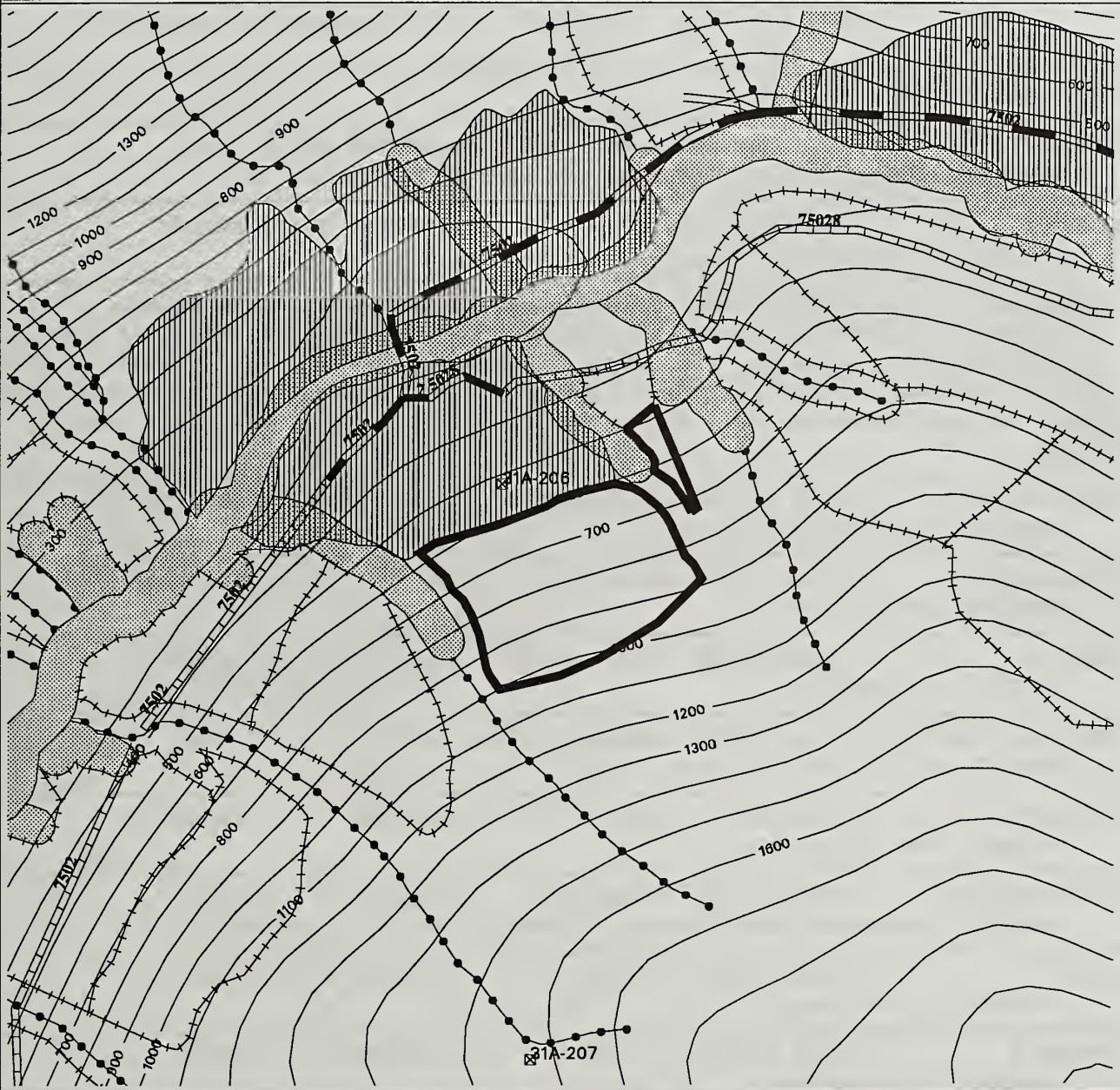
{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

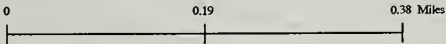
{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Buffers and unharvested areas will provide suitable travel corridors.

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21610 QUAD(s): SITD5NE
ACRES: 28 Unit 21610 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL



MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



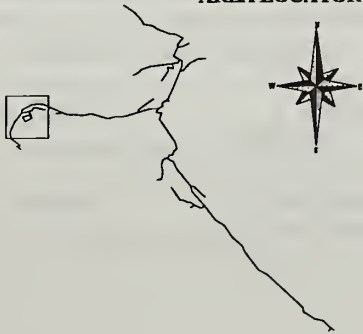
EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 21711

VCU: 2221

ACRES: 2.7

VOLUME (MBF): 49

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
E	90	44	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: FSO channels on E and W boundaries are class II. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a. Leave windfirm boundary; recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to both stream buffers to increase probability that they will remain windfirm.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = High.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend cable system, clearcut, partial suspension.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD PLANNED HARVEST UNIT MAP

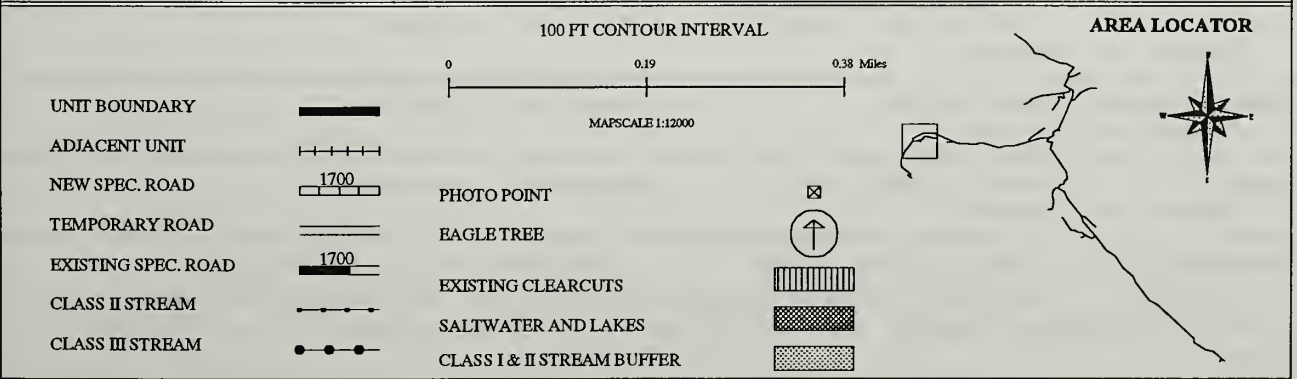
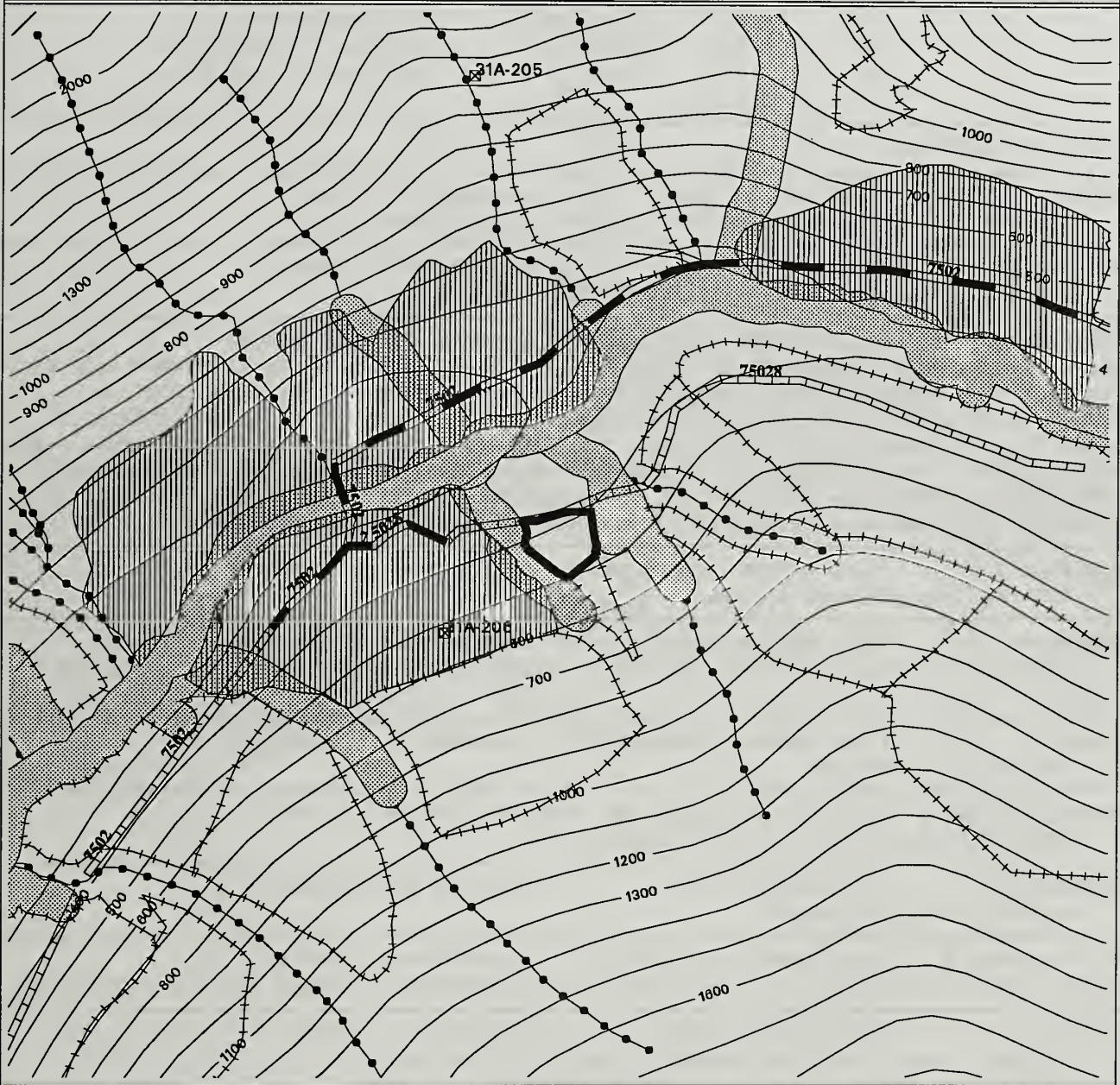
VCU: 2221

UNIT NUMBER: 21711

QUAD(s): SITD5NE

ACRES: 3

Unit 21711 Occurs in Alternatives:E



INDIAN RIVER UNIT CARD

UNIT: 21811
ACRES: 8.5

VCU: 2221
VOLUME (MBF): 142

		ALTERNATIVE SUMMARY		
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	28	Helicopter	Group Selection
E	90	128	Cable	Clearcut w/ retention
F	90	128	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams along lower NW boundary and lower end of HC6 channel on SW boundary. Maintain min. 100-ft buffer on Class I and II, Category A streams (BMP 12.6a). If harvest is >60%, leave windfirm boundary. Recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability of remaining windfirm, along MM2 class I buffer and class II buffer in SW corner. Class III section of HC6 channel on S boundary is category B stream. Protect as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class III stream for Alternatives E and F. BMP 12.6a; 13.16.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention due to blowdown concerns; partial suspension.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on south side of unit.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Buffers and unharvested areas will provide suitable travel corridors. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD PLANNED HARVEST UNIT MAP

VCU: 2221

UNIT NUMBER: 21811

QUAD(s): SITD5NE

ACRES: 9

Unit 21811 Occurs in Alternatives: B E F



UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM

100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR

Compass rose and locator map showing the project area's location within a larger regional context.

INDIAN RIVER UNIT CARD

UNIT: 21820
ACRES: 51.9

VCU: 2221
VOLUME (MBF): 1028

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	206	Helicopter	Group Selection
C	90	925	Cable	Clearcut w/ retention
D	90	925	Cable	Clearcut w/ retention
E	90	925	Cable	Clearcut w/ retention
F	90	925	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams, including MM2 channel along lower N boundary and the class II AF2 stream on E boundary. Maintain min. 100-ft buffer on Class I and II, Category A streams (BMP 12.6a). Leave windfirm boundary; recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability of remaining windfirm.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate/High.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention due to concerns with blowdown; partial suspension.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: S.GODFREY	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Buffers/unharvested areas will provide suitable travel corridors. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

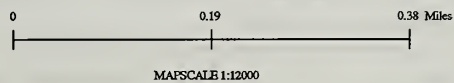
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21820 QUAD(s): SITD5NE
ACRES: 39 Unit 21820 Occurs in Alternatives: B C D E F

100 FT CONTOUR INTERVAL

AREA LOCATOR



UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 21830
ACRES: 22.8

VCU: 2221
VOLUME (MBF): 534

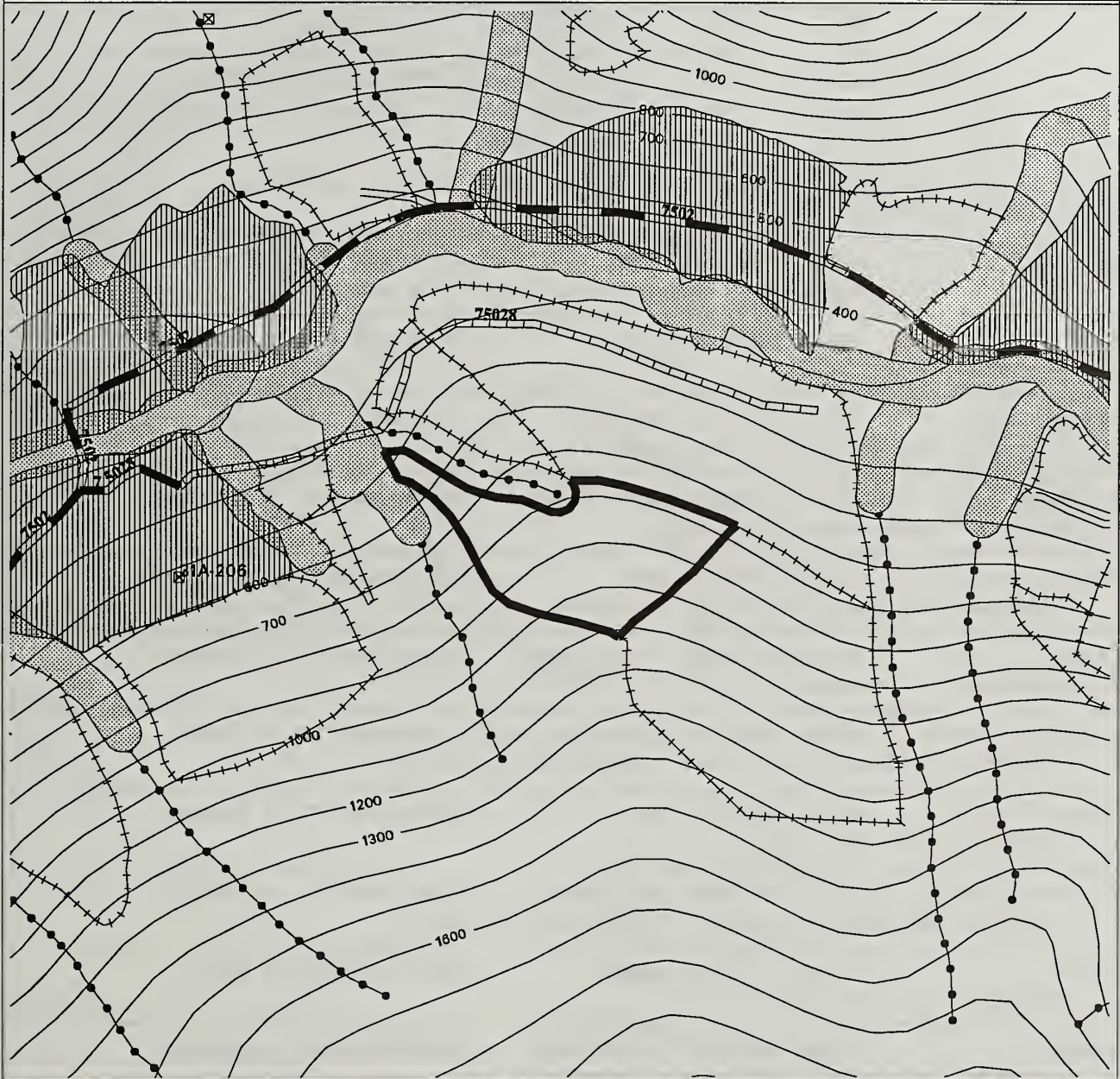
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	481	Helicopter	Clearcut w/ retention
C	90	481	Helicopter	Clearcut w/ retention
D	90	481	Helicopter	Clearcut w/ retention
E	90	481	Helicopter	Clearcut w/ retention
F	90	481	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams in lower NW corner, where HC6 channels become class II HC2 streams. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a. HC6 channels on NW and W boundaries are class III, category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary .		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate/High		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut, helicopter harvest.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: L.WINN, S.GODFREY	APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21830 QUAD(s): SITD5NE
 ACRES: 23 Unit 21830 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 21840

VCU: 2221

ACRES: 43.4

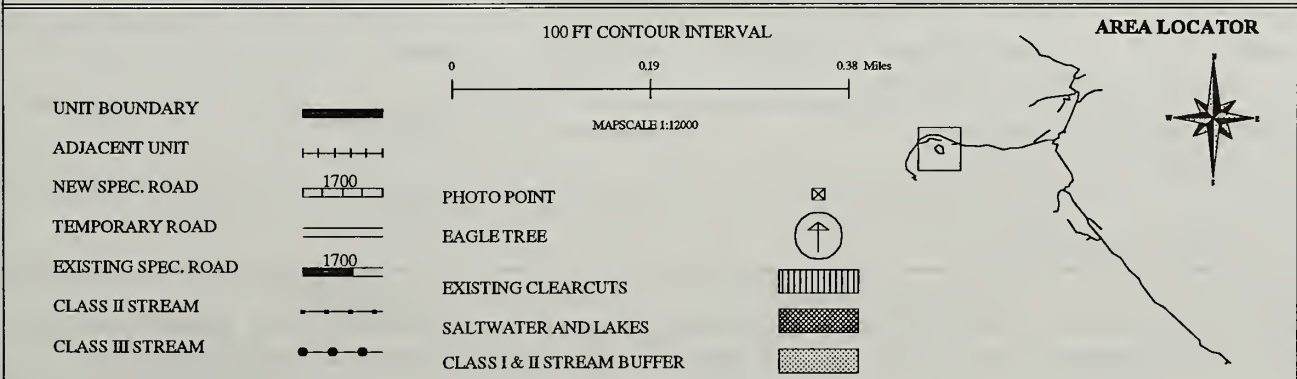
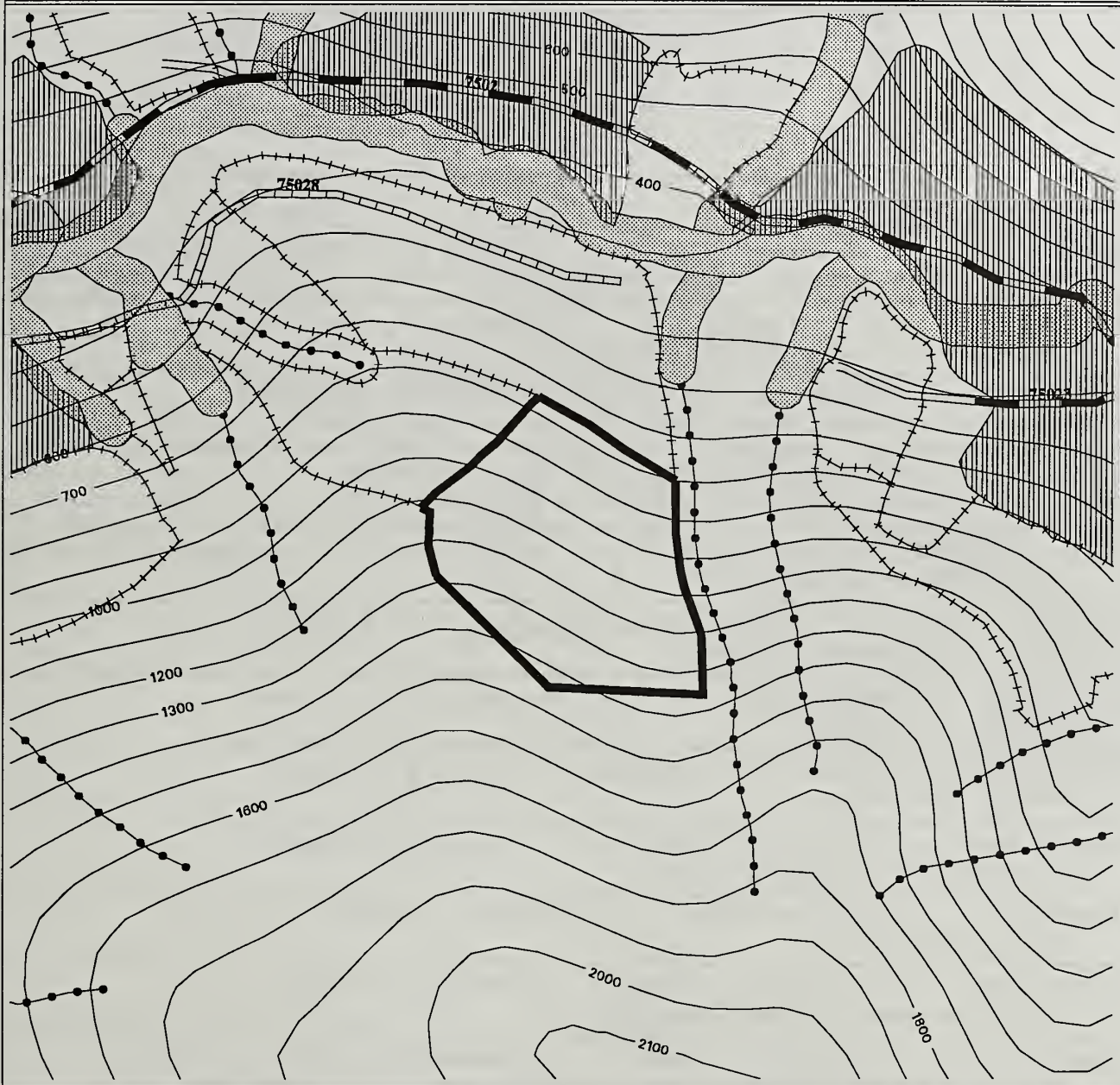
VOLUME (MBF): 1168

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	1003	Helicopter	Clearcut w/ retention
C	90	1003	Helicopter	Clearcut w/ retention
D	90	1003	Helicopter	Clearcut w/ retention
E	90	1003	Helicopter	Clearcut w/ retention
F	90	1003	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: See hydrology for remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class III stream. BMP 12.6a; 13.16.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate/High		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut, helicopter harvest.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: S.GODFREY	APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21840 QUAD(s): SITD5NE
ACRES: 45 Unit 21840 Occurs in Alternatives: B C D E F



INDIAN RIVER UNIT CARD

UNIT: 21910 VCU: 2221
ACRES: 11.7 VOLUME (MBF): 211

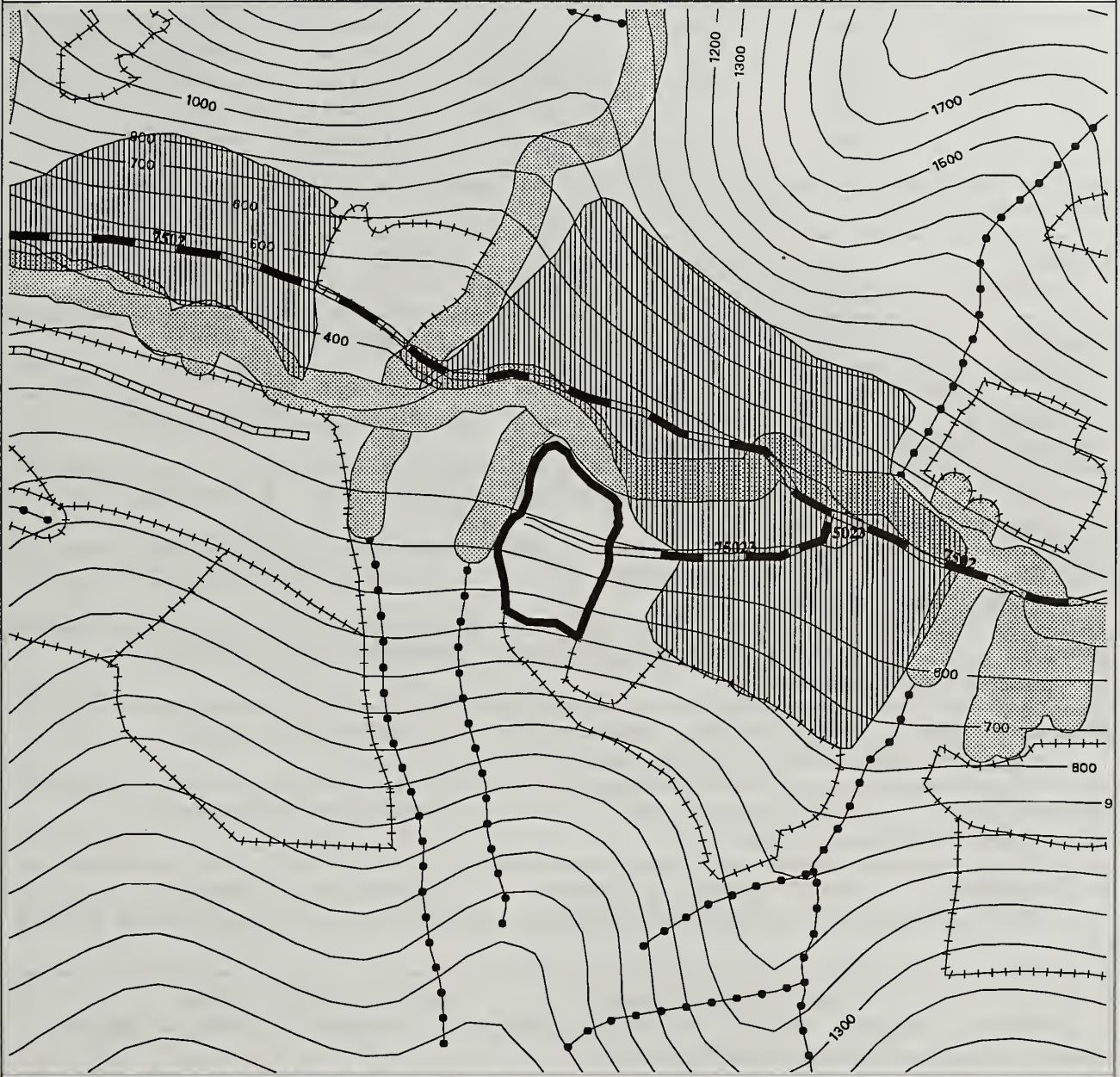
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	105	Helicopter	Overstory Removal
C	90	190	Helicopter	Clearcut w/ retention
D	90	190	Helicopter	Clearcut w/ retention
E	90	190	Helicopter	Clearcut w/ retention
F	90	190	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams, including class I, MM2 channel along lower N boundary and class I/II, AF2 channel along lower W boundary. Maintain windfirm (min. 100 ft.) buffer on class I, category A stream(s) (BMP 12.6a). Recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability of remaining windfirm. HC6 channel upstream of AF2 is class III, category B. Protect per BMP 13.16 (and 13.3). Leave windfirm boundary .		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend helicopter yarding.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Recommend partial suspension. Windfirm boundary on west side.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: Recommend clearcut.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Buffers and unharvested areas will provide suitable travel corridors. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21910 QUAD(s): SITD5NE
 ACRES: 12 Unit 21910 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



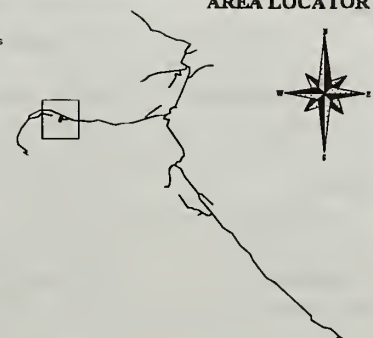
EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



Plotted 08/25/97

INDIAN RIVER UNIT CARD

UNIT: 22010
ACRES: 26.0

VCU: 2221
VOLUME (MBF): 458

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	229	Helicopter	Overstory Removal
C	50	229	Helicopter	Overstory Removal
D	50	229	Helicopter	Overstory Removal
E	80	367	Helicopter	Overstory Removal
F	80	367	Helicopter	Overstory Removal

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: See soils for remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend helicopter yarding. Maintain root strength and stable soils.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: Partial harvest to retain some root strength. Leave windfirm boundary along southeast side of unit.		
{ TIMBER }	FIELD REVIEW: L.WINN, S.GODFREY	APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using overstory removal harvest system, implement W/L marten S&G XVI.A.2.c).		

VCU: 2221 UNIT NUMBER: 22010 QUAD(s): SITD5NE
 ACRES: 26 Unit 22010 Occurs in Alternatives: B C D E F

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

100 FT CONTOUR INTERVAL

MAP SCALE 1:12000

AREA LOCATOR

Plotted 08/25/97

INDIAN RIVER UNIT CARD

UNIT: 22110
ACRES: 14.2

VCU: 2221
VOLUME (MBF): 259

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	129	Helicopter	Overstory Removal
C	40	103	Helicopter	Single Tree Selection
D	40	103	Helicopter	Single Tree Selection
E	40	103	Helicopter	Single Tree Selection
F	40	103	Helicopter	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams. This includes at least 6 streams along the lower N boundary that become class III upstream within the unit. Maintain min. 100-ft buffer on Class II, Category A streams (BMP 12.6a). Protect multiple class III, category B and C streams in the unit and along E boundary (BMP 13.16 and 13.3). These v-notch channels in this heavily dissected ground have unstable banks. Split-yard v-notch or recommend full suspension for these streams.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend overstory removal >20 inches dbh with directional falling due to highly dissected ground and stand defect.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Partial harvest to retain root strength.

{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Buffers and unharvested areas will provide suitable travel corridors.

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

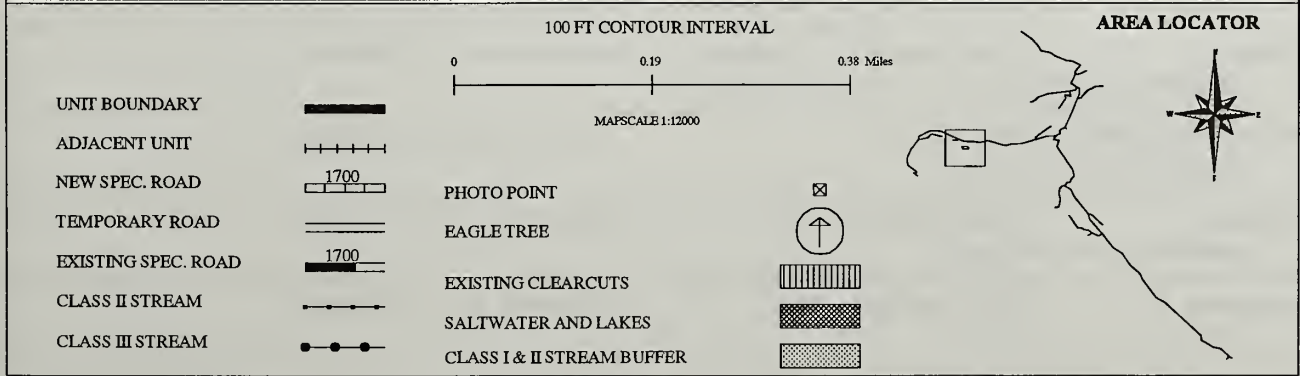
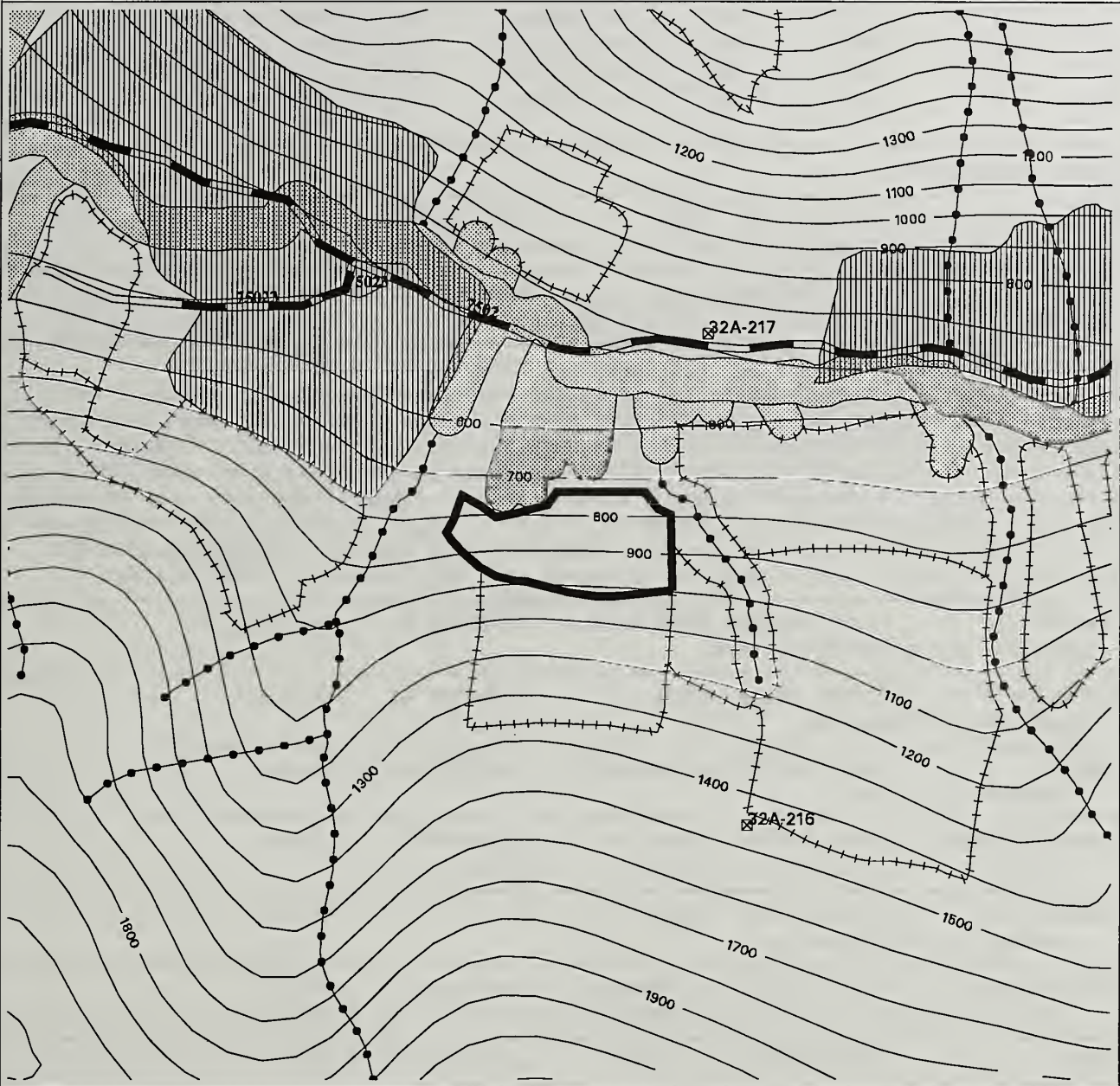
VCU: 2221

UNIT NUMBER: 22110

QUAD(s): SITD5NE

ACRES: 14

Unit 22110 Occurs in Alternatives: B C D E F



INDIAN RIVER UNIT CARD

UNIT: 22120
ACRES: 26.4

VCU: 2221
VOLUME (MBF): 543

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	40	217	Helicopter	Single Tree Selection
D	40	217	Helicopter	Single Tree Selection
E	40	217	Helicopter	Single Tree Selection
F	40	217	Helicopter	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams. This includes main channel, class I MM2 along lower N boundary, 3 smaller class I/II FSO streams along lower boundary, and lower ends of HC6 channels on E and W boundaries. Maintain min. 100-ft buffer on Class II, Category A streams (BMP 12.6a). Protect the class III, category B and C streams within the unit (upstream ends of smaller class II at lower unit boundary), and the category B, channels along E and W boundaries as per BMP 13.16 (and 13.3). These v-notch channels in this heavily dissected ground have unstable banks. Split-yard v-notch or recommend full suspension for these streams.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend helicopter harvest, individual tree selection.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Partial harvest to retain root strength.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

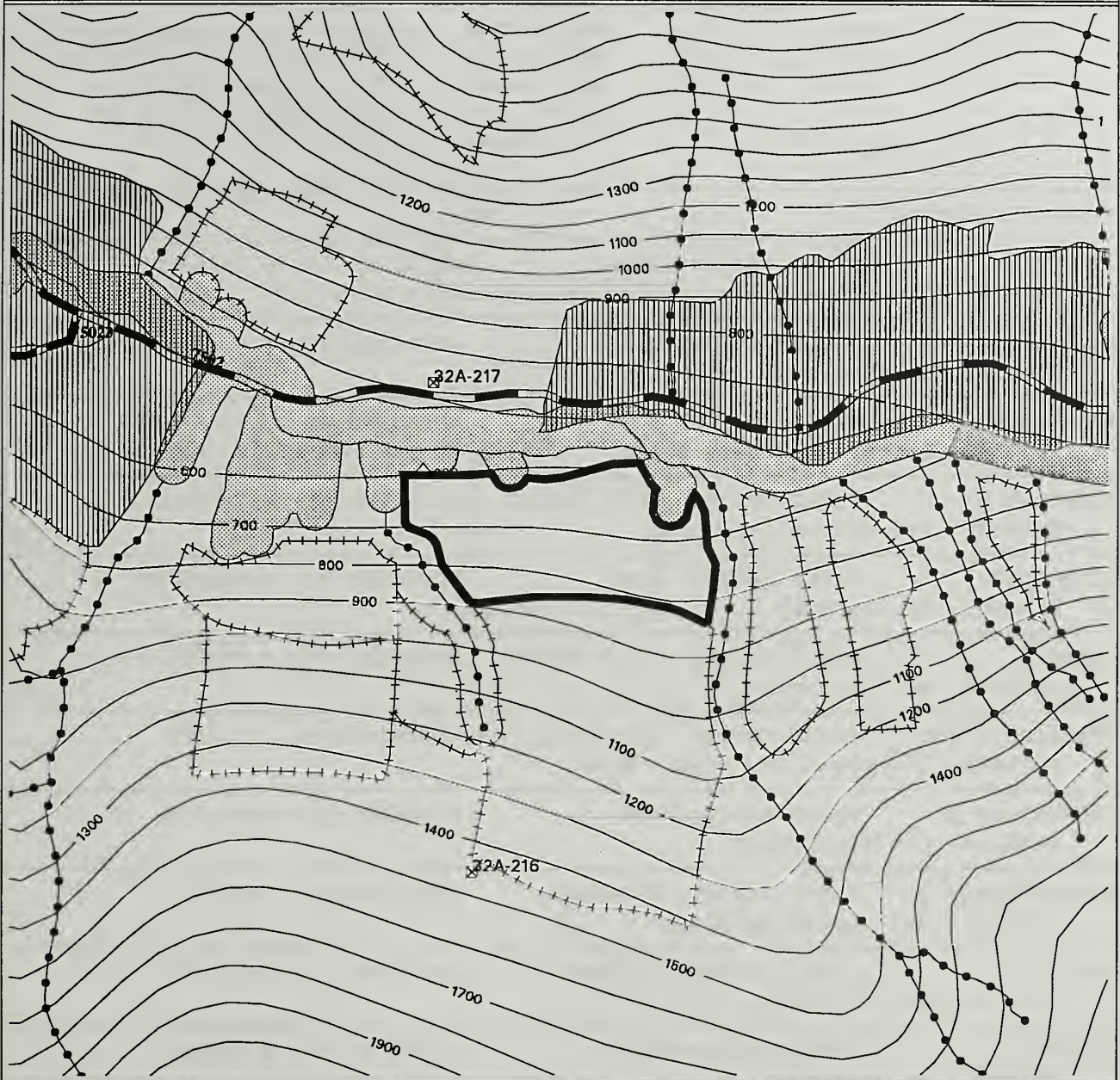
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: No concerns.

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 22120 QUAD(s): SITD5NE
 ACRES: 26 Unit 22120 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



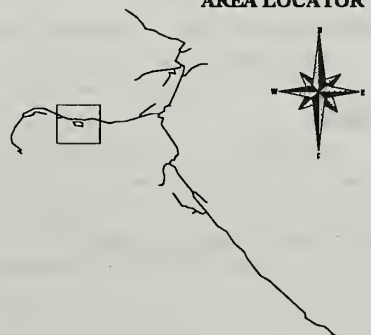
SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 22130
ACRES: 20.5

VCU: 2221
VOLUME (MBF): 374

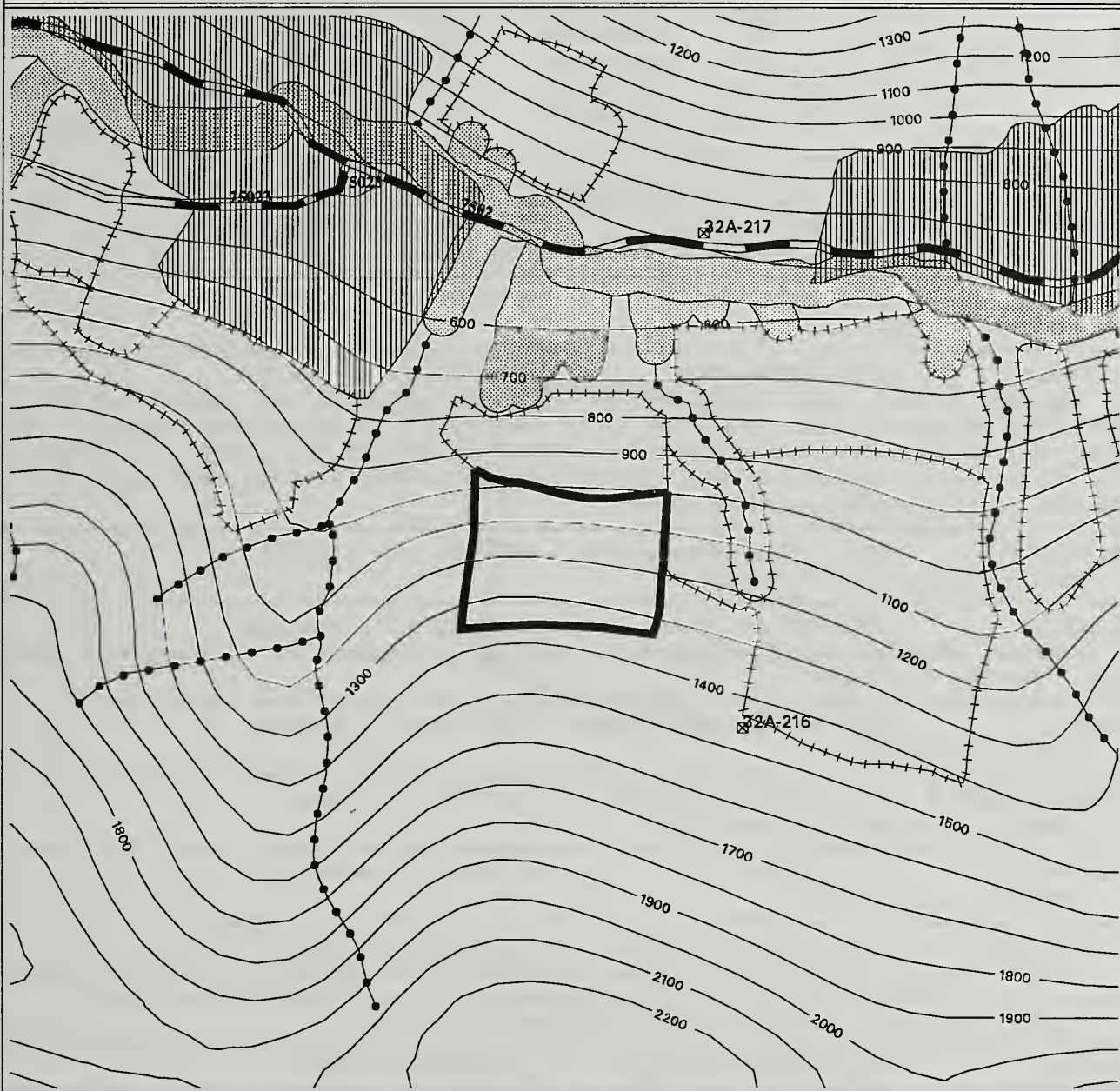
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	337	Helicopter	Clearcut w/ retention
C	90	337	Helicopter	Clearcut w/ retention
D	90	337	Helicopter	Clearcut w/ retention
E	90	337	Helicopter	Clearcut w/ retention
F	90	337	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: Protect category B and C streams as per BMP 13.16 (and 13.3).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Helicopter yarding.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 22130 QUAD(s): SITD5NE
 ACRES: 20 Unit 22130 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 22140
ACRES: 57.5

VCU: 2221
VOLUME (MBF): 1049

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	944	Helicopter	Clearcut w/ retention
C	40	420	Helicopter	Single Tree Selection
D	40	420	Helicopter	Single Tree Selection
E	40	420	Helicopter	Single Tree Selection
F	40	420	Helicopter	Single Tree Selection

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: Protect large, deeply incised category B class III, HC6 channels on SE boundary and within NW corner as per BMP 13.16 (and 13.3). Leave windfirm boundary . Also, protect smaller class III, category B and C streams within unit as per BMP 13.16 (and 13.3). These v-notch channels in this heavily dissected ground have unstable banks. Directional fall v-notch for these streams.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundaries to class III streams for Alternative B. (BMP 13.16). Heavily v-notched.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend helicopter harvest, individual tree selection. Recommend partial cutting due to stability concerns on V-notches where some soil unraveling was noted. Directional falling in this area can help mitigate the concern.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Partial harvest to retain root strength.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns..		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS:When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

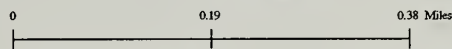
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 22140 QUAD(s): SITD5NE
 ACRES: 57 Unit 22140 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL



MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 22210
ACRES: 22.0

VCU: 2221
VOLUME (MBF): 438

		ALTERNATIVE SUMMARY		
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	90	394	Helicopter	Clearcut w/ retention
D	90	394	Helicopter	Clearcut w/ retention
E	90	394	Helicopter	Clearcut w/ retention
F	90	394	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along lower N boundary (MM1 main channel) and lower end of HC5 channel on NE side. Maintain windfirm (minimum of 100 ft) buffer on class I and II, category A stream(s) as per BMP 12.6a. Deeply incised HC5 (upstream of class II) and HC6 channels on E and W boundaries and stream between the two blocks are class III, category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary .

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class III streams. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention for 95% of volume, helicopter yarding.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Recommend windfirm boundaries on V-notches. Recommend helicopter yarding.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Recommend clearcut with retention, helicopter yarding.

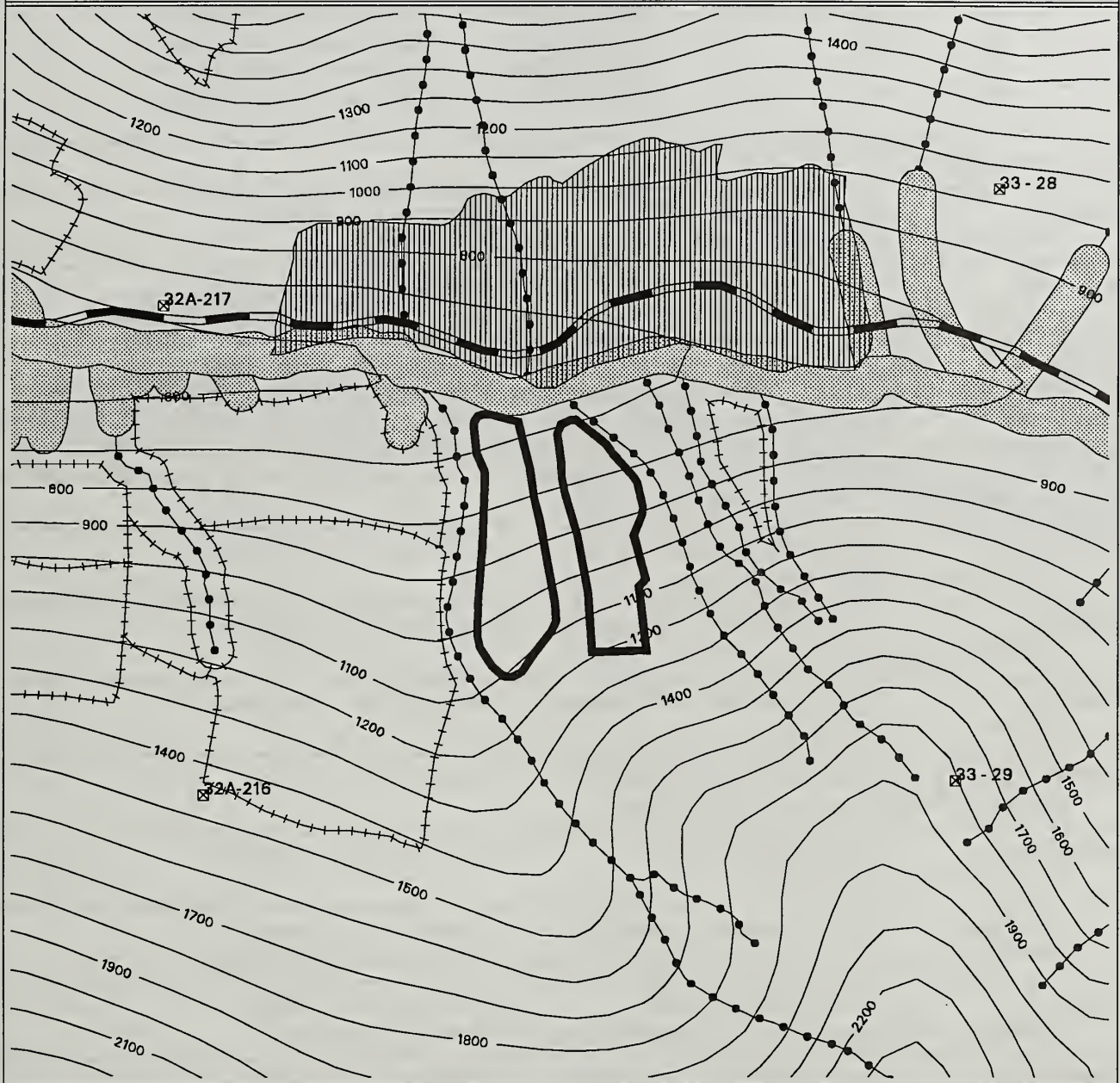
{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

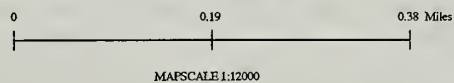
{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 22210 QUAD(s): SITD5NE
ACRES: 22 Unit 22210 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL



AREA LOCATOR



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 22230
ACRES: 3.5

VCU: 2221
VOLUME (MBF): 78

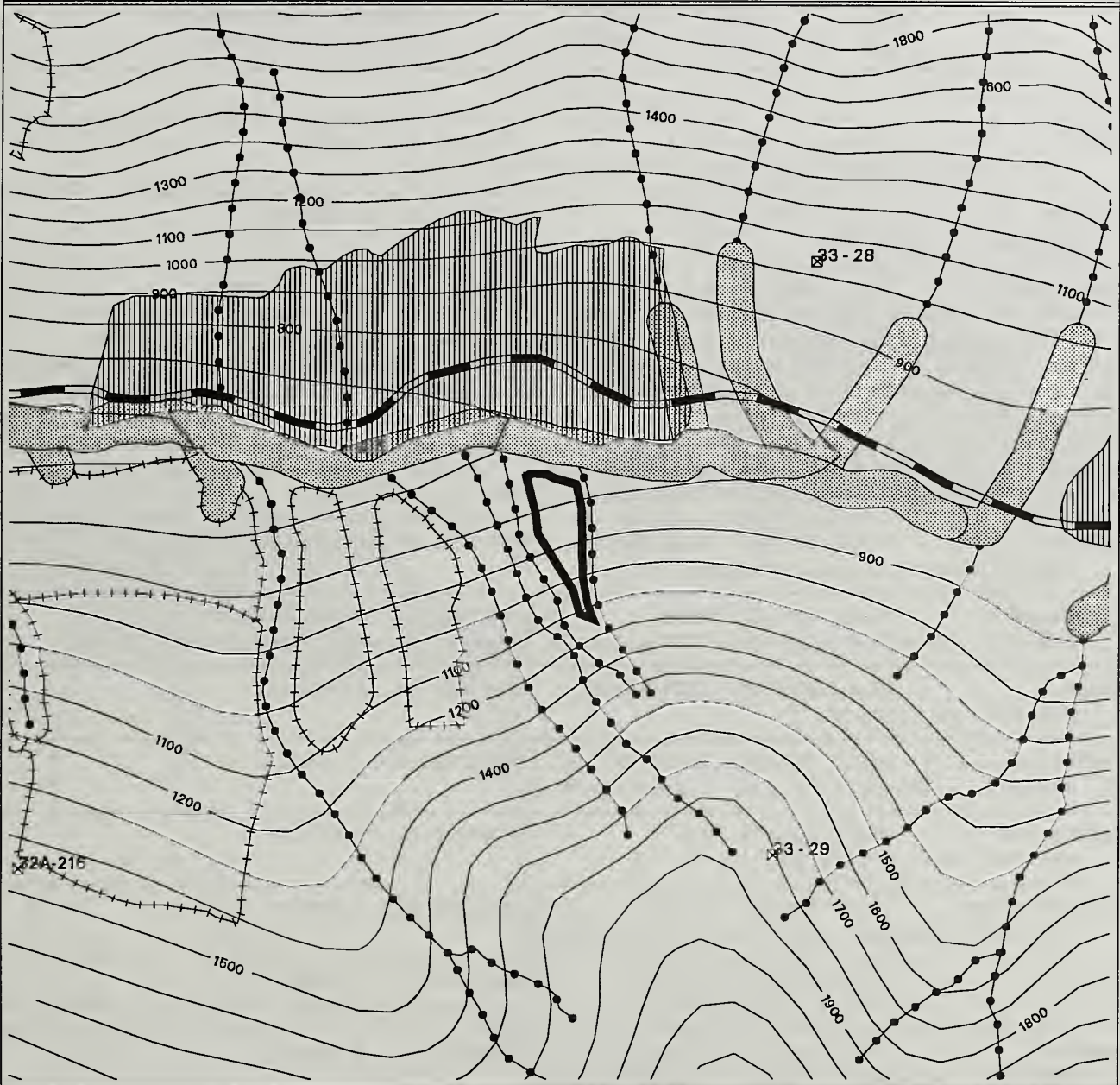
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	90	70	Helicopter	Clearcut w/ retention
D	90	70	Helicopter	Clearcut w/ retention
E	90	70	Helicopter	Clearcut w/ retention
F	90	70	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along lower N boundary (MM1 channel). Maintain windfirm (minimum of 100 ft) buffer on class I, category A stream(s) as per BMP 12.6a. Protect incised HC5 and HC6, class III, category B streams on E and W boundaries as per BMP 13.16 (and 13.3). Leave windfirm boundary .		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention. Recommend helicopter yarding.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: Recommend windfirm boundary on an east side V-notch.		
{ TIMBER }	FIELD REVIEW: S.GODFREY	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

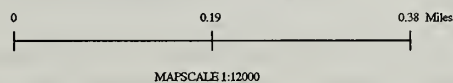
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 22230 QUAD(s): SITD5NE
 ACRES: 4 Unit 22230 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 60420
ACRES: 30.7

VCU: 2160
VOLUME (MBF): 1023

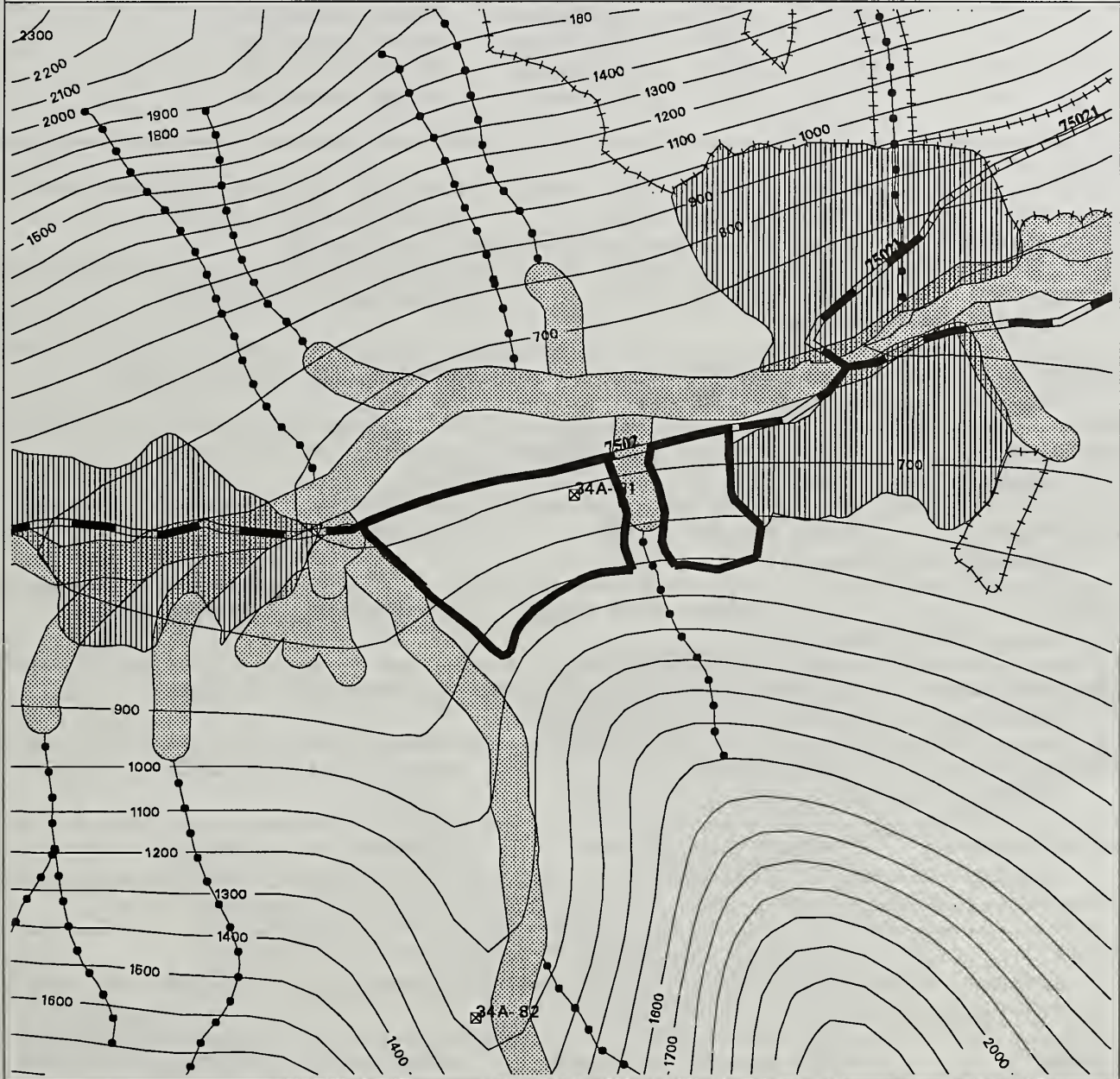
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	90	921	Cable	Clearcut w/ retention
D	90	921	Cable	Clearcut w/ retention
F	90	921	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along E and W boundaries of larger block. Maintain windfirm (minimum of 100 ft) buffer on class I and II, category A stream(s) as per BMP 12.6a. Existing blowdown on east side of this area next to old clearcut is a concern. Recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability that they will remain windfirm along HC2 and HC3 buffers, especially the east side of them. Upstream of HC2, the HC6 channel between the two blocks is class III, category B stream. Protect as per BMP 13.16 (and 13.3).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundaries to class II streams. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate/High		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Recommend split-yarding v-notches and make a windfirm boundary on west side.		
{ TIMBER }	FIELD REVIEW: B.BEALL	APPROVED BY: M.REGAN
REMARKS: Recommend clearcut, cable yarding.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: K.RUTLEDGE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Buffers and unharvested areas will provide suitable travel corridors. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 60420 QUAD(s): SITD5NE
 ACRES: 31 Unit 60420 Occurs in Alternatives: C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 60710
ACRES: 58.8

VCU: 2160
VOLUME (MBF): 1235

		ALTERNATIVE SUMMARY		
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	20	247	Helicopter	Group Selection
D	20	247	Helicopter	Group Selection
E	20	247	Helicopter	Group Selection
F	20	247	Helicopter	Group Selection

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: See soils for remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend group selection for 20% of volume to ensure regeneration. Recommend helicopter yarding.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Partial harvest to retain root strength and protect shallow soils to ensure regeneration.		
{ TIMBER }	FIELD REVIEW: S.GODFREY	APPROVED BY: M.REGAN
REMARKS: Recommend group selection due to risk of blowdown.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: K.RUTLEDGE	APPROVED BY: L.SHIPLEY
REMARKS: Inactive goshawk nest site in unit. Survey for goshawks as funding allows. If active nest is located, implement TES goshawk S&G J.1.a) (1-6)b)c). Buffers and unharvested areas will provide suitable travel corridors.		

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 60710 QUAD(s): SITD5NE
ACRES: 59 Unit 60710 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



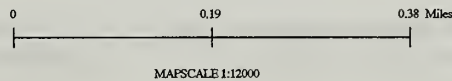
EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 60810
ACRES: 4.5

VCU: 2160
VOLUME (MBF): 127

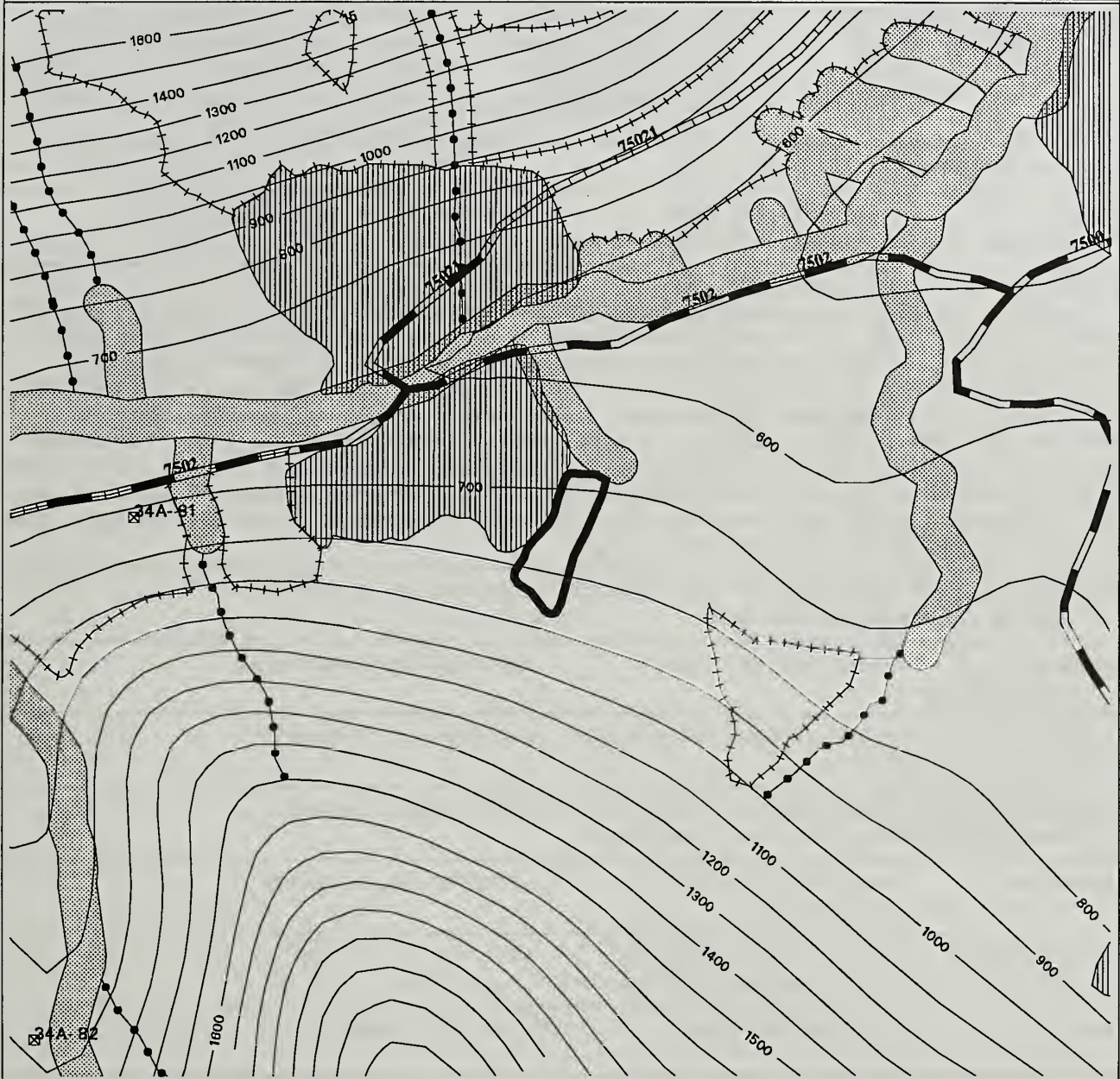
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	90	114	Helicopter	Clearcut w/ retention
D	90	114	Helicopter	Clearcut w/ retention
E	90	114	Helicopter	Clearcut w/ retention
F	90	114	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: No concerns.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: G.PETERSON	APPROVED BY: M.REGAN
REMARKS: Recommend helicopter yarding.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 60810 QUAD(S): SITD5NE
 ACRES: 5 Unit 60810 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



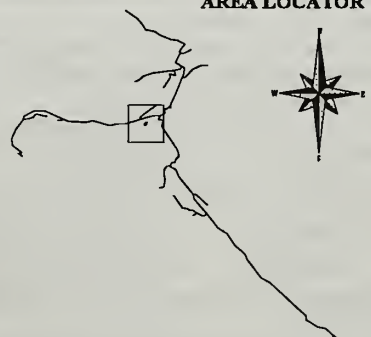
SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 60910
ACRES: 10.5

VCU: 2160
VOLUME (MBF): 84

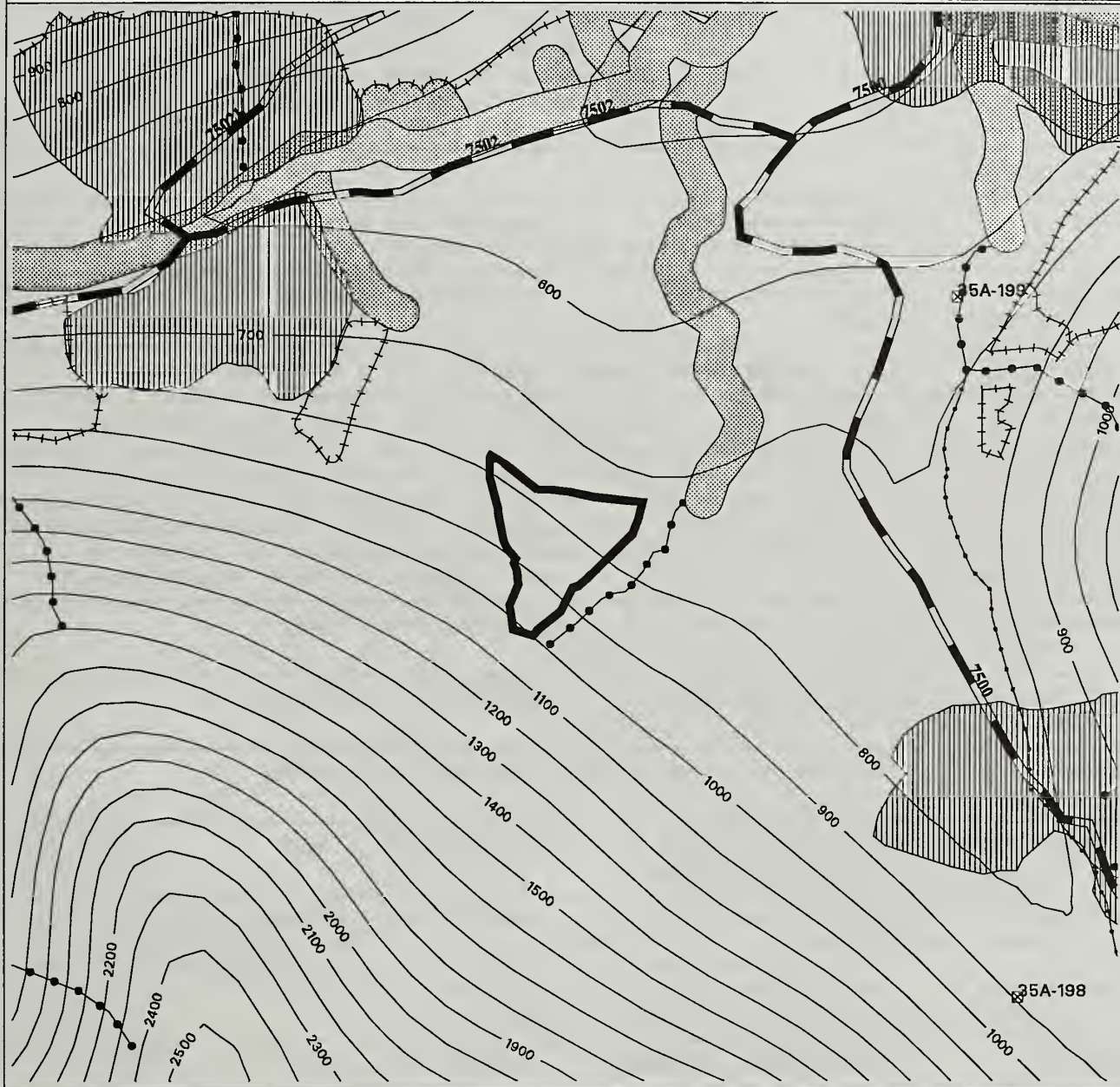
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	90	75	Helicopter	Clearcut w/ retention
D	90	75	Helicopter	Clearcut w/ retention
E	90	75	Helicopter	Clearcut w/ retention
F	90	75	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics. Maintain adequate wildlife corridors.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Buffer on Class II stream in lower center of unit. Stream is not currently entered into the GIS database. Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams (class II) along lower N boundary. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a. Class III, HC6 channels on SE and W boundaries are category B; protect as per BMP 13.16 (and 13.3). Recommend placing unit boundary at or above slope break of Class III channels (2/3 rule) to provide windfirm boundaries.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: BMP 13.16.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with regeneration islands.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: G.PETERSON , M.REGAN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Buffers and unharvested areas will provide suitable travel corridors. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 60910 QUAD(s): SITD5NE
 ACRES: 10 Unit 60910 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 61011
ACRES: 18.4

VCU: 2160
VOLUME (MBF): 413

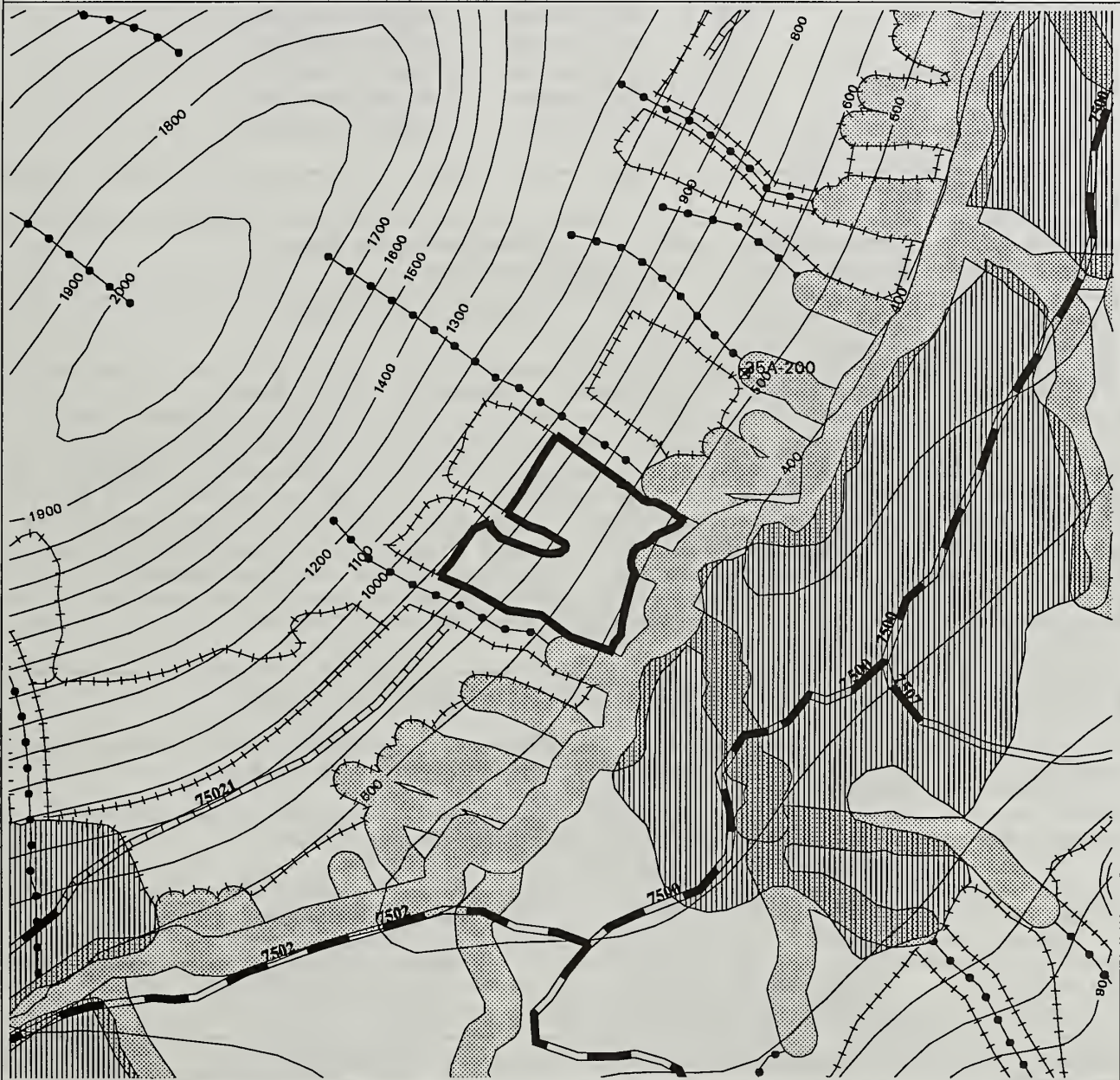
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	83	Helicopter	Group Selection
C	40	165	Helicopter	Patch Clearcut
D	40	165	Helicopter	Patch Clearcut
F	40	165	Helicopter	Patch Clearcut

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams, including large floodplain (FP4), class I channel and associated secondary channels, and class II AF1 channels on lower SE, NE, and SW boundaries. Implement 170 ft wide riparian conservation zones on FP4 channel. Maintain windfirm (min. 100 ft) buffer on class I, category A stream(s) per BMP 12.6a. Recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm. HC6 channels on NE and SW boundaries are class III, category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary on HC6 channels.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: BMP 13.16.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend helicopter harvest, group selection.		
{ SOILS }	FIELD REVIEW: F.GLENN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: B.BEALL	APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: Partial harvest to maintain travel corridor.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: No concerns.		

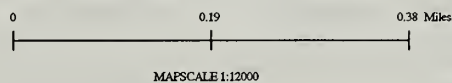
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61011 QUAD(s): SITD5NE/SITD4NW
 ACRES: 18 Unit 61011 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL



AREA LOCATOR



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 61012
ACRES: 9.7

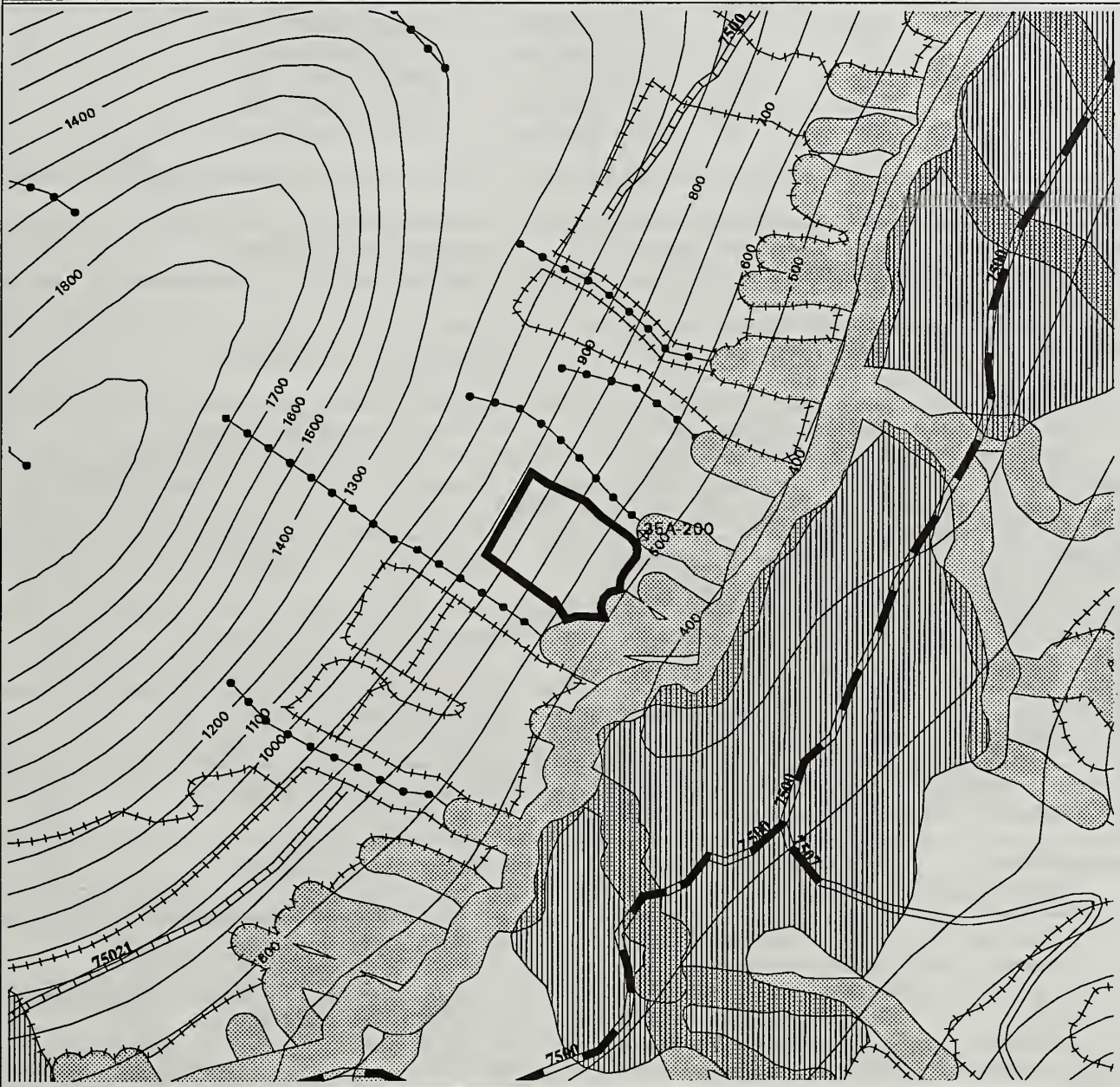
VCU: 2160
VOLUME (MBF): 182

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	36	Helicopter	Group Selection
C	40	73	Helicopter	Patch Clearcut
D	40	73	Helicopter	Patch Clearcut
E	20	36	Helicopter	Group Selection
F	20	36	Helicopter	Group Selection

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams, including floodplain FP4, class I channel, associated secondary channels, and class I/II AF1, HC2 and FSO channels along lower SE boundary. Implement 170 ft wide riparian conservations zones on FP4 channel. Maintain windfirm (min. 100 ft) buffer on class I, category A stream(s) (BMP 12.6a). Keep lower unit boundary uphill of slope break, where FSO channels upwell. HC6 channels on NE and SW boundaries are class III, category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary .		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: BMP 13.16.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend helicopter harvest, group selection.		
{ SOILS }	FIELD REVIEW: F.GLENN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: B.BEALL	APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: Partial harvest to maintain travel corridor.		

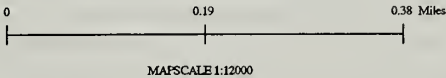
INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP








VCU: 2160 UNIT NUMBER: 61012 QUAD(s): SITD4NW
ACRES: 10 Unit 61012 Occurs in Alternatives: B C D E F








100 FT CONTOUR INTERVAL

AREA LOCATOR



- UNIT BOUNDARY 
- ADJACENT UNIT 
- NEW SPEC. ROAD 
- TEMPORARY ROAD 
- EXISTING SPEC. ROAD 
- CLASS II STREAM 
- CLASS III STREAM 

- PHOTO POINT 
- EAGLE TREE 
- EXISTING CLEARCUTS 
- SALTWATER AND LAKES 
- CLASS I & II STREAM BUFFER 



INDIAN RIVER UNIT CARD

UNIT: 61020 VCU: 2160
ACRES: 26.3 VOLUME (MBF): 491

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	98	Helicopter	Group Selection
C	20	98	Helicopter	Group Selection
D	20	98	Helicopter	Group Selection
E	20	98	Helicopter	Group Selection
F	20	98	Helicopter	Group Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Alpine/subalpine habitat; moderate survey priority. Recommend botanist present during layout.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: About 9 class III streams, category B and C, extend uphill from the Class I/II streams identified near the valley bottom main channel. Protect class III, category B and C streams as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend clearcut.

{ SOILS } FIELD REVIEW: F.GLENN APPROVED BY: J.WINN
REMARKS: Partial harvest to retain some root strength.

{ TIMBER } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: No concerns.

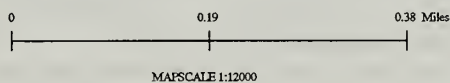
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61020 QUAD(s): SITD5NE
 ACRES: 26 Unit 61020 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 61030
ACRES: 34.9

VCU: 2160
VOLUME (MBF): 810

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	70	567	Helicopter	Overstory Removal
C	90	729	Cable	Clearcut w/ retention
D	90	729	Cable	Clearcut w/ retention
E	90	729	Cable	Clearcut w/ retention
F	90	729	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams, including upstream end of class II habitat on smaller footslope (FSO) channels throughout the unit, and AF1 channel on NE boundary. Implement 170 ft wide riparian conservation zones on valley bottom FP4 channel. Maintain windfirm (min. 100 ft) buffer on class I and II, category A stream(s) (BMP 12.6a); Recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm. Protect class III, category C streams that extend uphill from the class II footslope streams per BMP 13.16 (and 13.3). Leave windfirm boundary on HC6 channel on NE boundary.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a; 13.16.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: F.GLENN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: G.PETERSON	APPROVED BY: M.REGAN
REMARKS: Recommend partial suspension.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

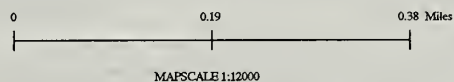
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61030 QUAD(s): SITD5NE/SITD4NW
ACRES: 35 Unit 61030 Occurs in Alternatives: B C D E F

100 FT CONTOUR INTERVAL

AREA LOCATOR



UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM

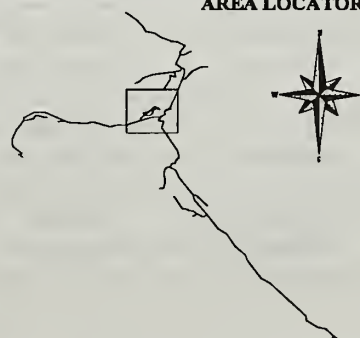
PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 61040
ACRES: 8.6

VCU: 2160
VOLUME (MBF): 156

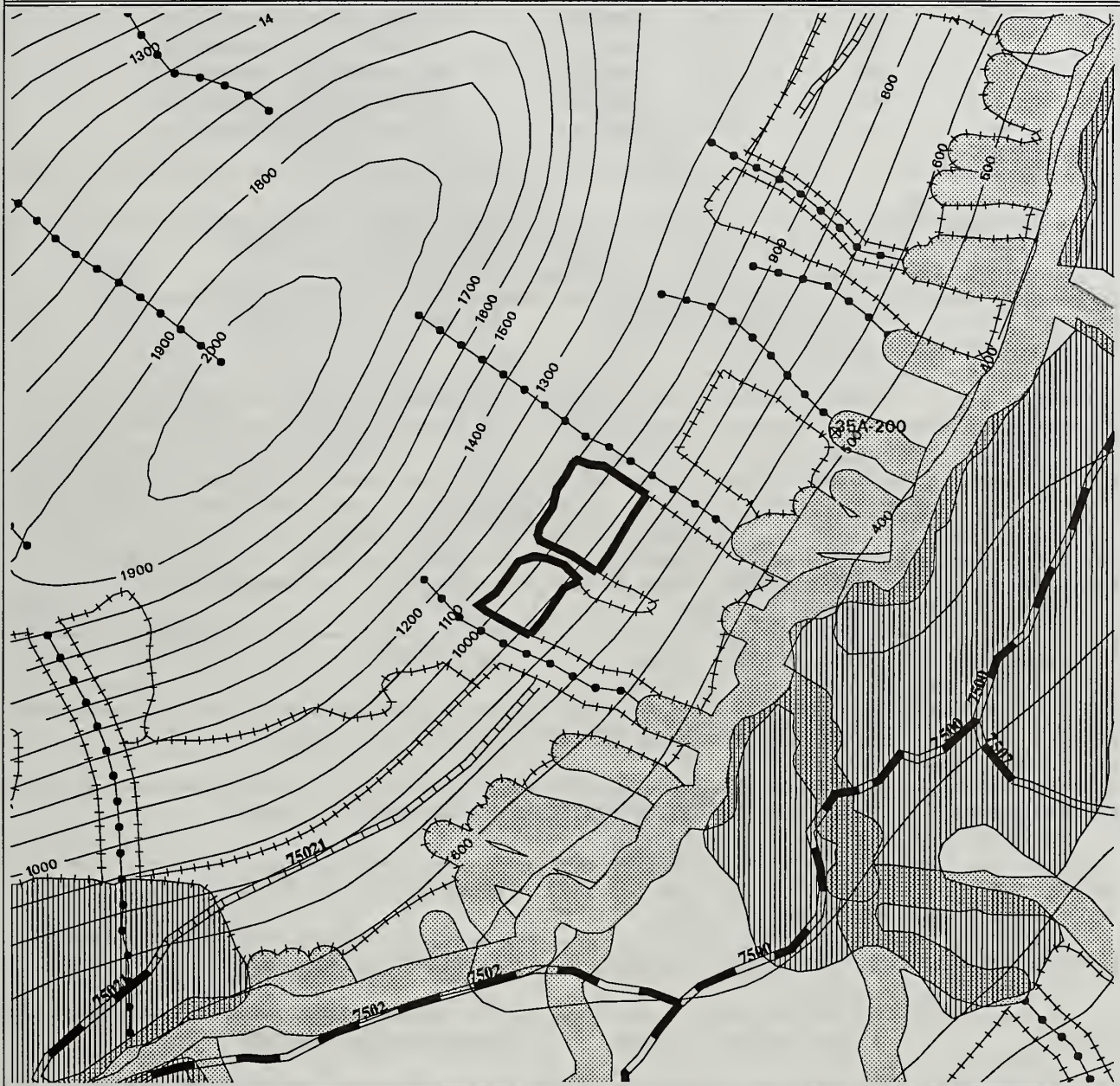
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	70	109	Helicopter	Overstory Removal
D	70	109	Helicopter	Overstory Removal
E	70	109	Helicopter	Overstory Removal
F	70	109	Helicopter	Overstory Removal

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: See hydrology for remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to west side class III stream. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend overstory removal of dominants for 70% of volume.		
{ SOILS }	FIELD REVIEW: F.GLENN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: B.BEALL	APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns.		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61040 QUAD(s): SITD5NE/SITD4NW
 ACRES: 9 Unit 61040 Occurs in Alternatives: C D E F



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



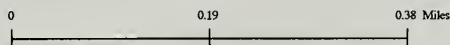
SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



100 FT CONTOUR INTERVAL



MAP SCALE 1:12000

AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 61310 VCU: 2160
ACRES: 11.7 VOLUME (MBF): 170

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	153	Cable	Clearcut w/ retention
C	90	153	Cable	Clearcut w/ retention
D	90	153	Cable	Clearcut w/ retention
E	90	153	Cable	Clearcut w/ retention
F	90	153	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along lower N and W boundaries. These include the main valley bottom MM2 (class I), a small footslope class II channel (FSO) in center of unit and HC2 and HC3 channels on the NE and W boundaries. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

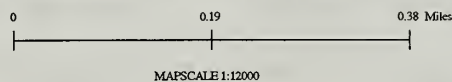
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61310 QUAD(s): SITD5NE
 ACRES: 8 Unit 61310 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL



AREA LOCATOR



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 61311 VCU: 2160
ACRES: 1.6 VOLUME (MBF): 30

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	90	27	Cable	Clearcut w/ retention
D	90	27	Cable	Clearcut w/ retention
E	90	27	Cable	Clearcut w/ retention
F	90	27	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams along lower N and W boundaries. These include the valley bottom, class I, MM2 channel, a footslope class II channel (FSO) on the W boundary and an HC2 channel on the NE boundary. Maintain min. 100-ft buffer on Class II, Category A streams (BMP 12.6a). Leave windfirm boundary; recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61311 QUAD(s): SITD5NE
 ACRES: 2 Unit 61311 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



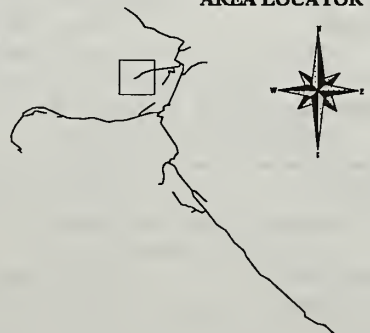
SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 61410 VCU: 2160
ACRES: 22.6 VOLUME (MBF): 619

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	503	Cable	Clearcut w/ retention
C	90	503	Shovel	Clearcut w/ retention
D	90	503	Shovel	Clearcut w/ retention
E	90	503	Shovel	Clearcut w/ retention
F	90	503	Shovel	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams all along lower N boundary next to valley bottom MM2/MC2 channel (class I), and the two HC2 and two FSO (small footslope) channels within the unit. Maintain windfirm (minimum of 100 ft) buffer on class I and II, category A stream(s) as per BMP 12.6a. The area (below the road) adjacent to the main channel buffer should be feathered (remove larger trees, retain smaller trees) to increase the probability that the buffer will remain windfirm.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: Recommend shovel yarding.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

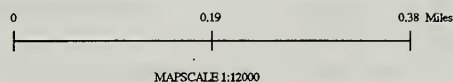
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61410 QUAD(S): SITD5NE
 ACRES: 25 Unit 61410 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL



AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 61510 VCU: 2160
ACRES: 29.6 VOLUME (MBF): 770

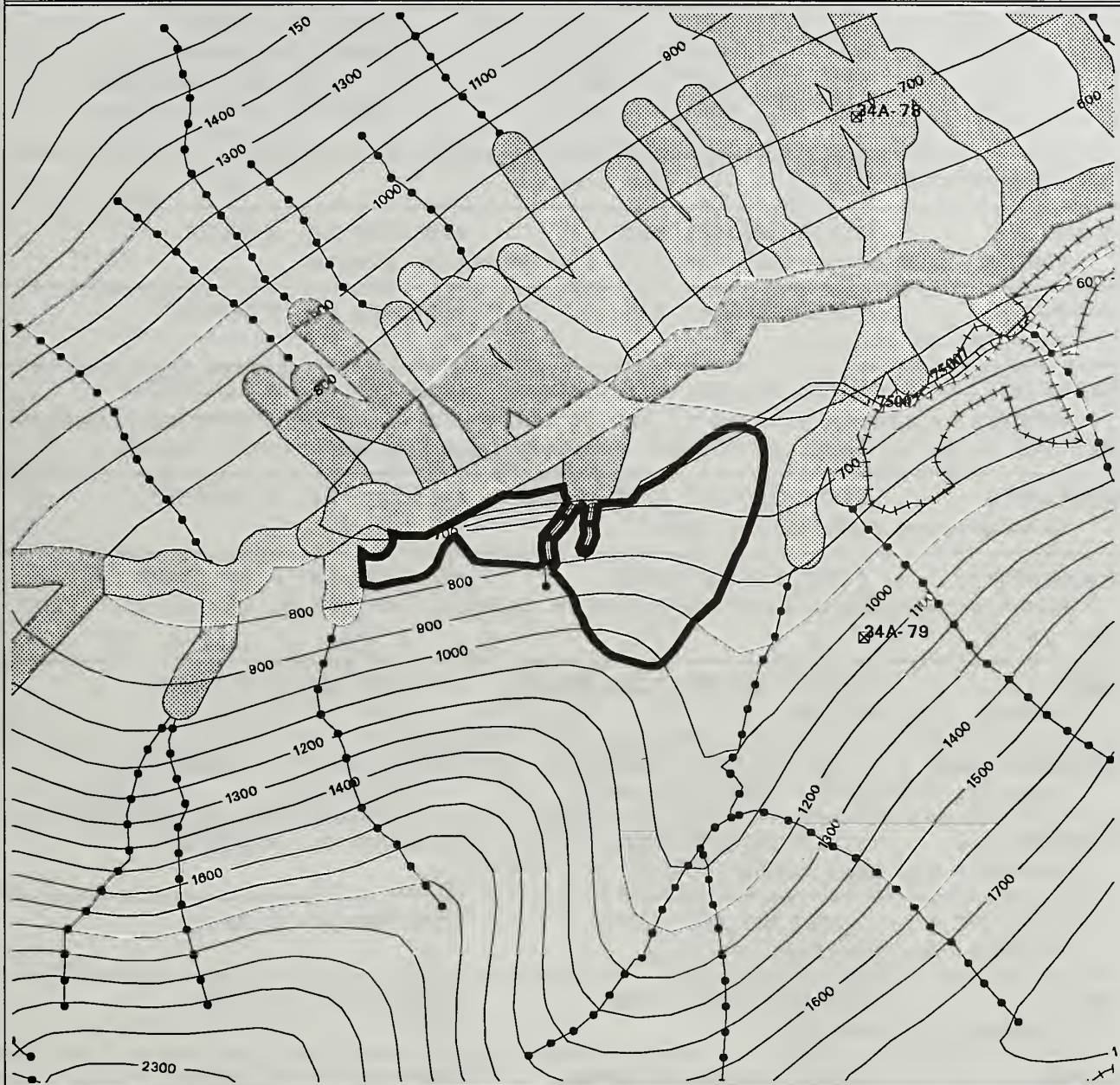
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	693	Helicopter	Clearcut w/ retention
C	90	693	Cable	Clearcut w/ retention
D	90	693	Cable	Clearcut w/ retention
E	90	693	Cable	Clearcut w/ retention
F	90	693	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including two small footslope, class II streams (FSO) in middle of unit, lower end of HC6 channel on W boundary, and the main MM2 channel along lower NW boundary. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a. Keep lower unit boundary at uphill side of muskeg benches. Leave windfirm boundary along HC6 and HC3 channels on W and E boundaries.		
{ HERITAGE }	FIELD REVIEW: P.BOWER	APPROVED BY: K.IWAMOTO
REMARKS: No concerns.		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a; 13.16.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Decadent.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Split-yard v-notch in middle of unit, for alternatives C, D, E, F		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: Recommend cable system.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61510 QUAD(s): SITD5NE
 ACRES: 30 Unit 61510 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 62610
ACRES: 34.3

VCU: 2041
VOLUME (MBF): 663

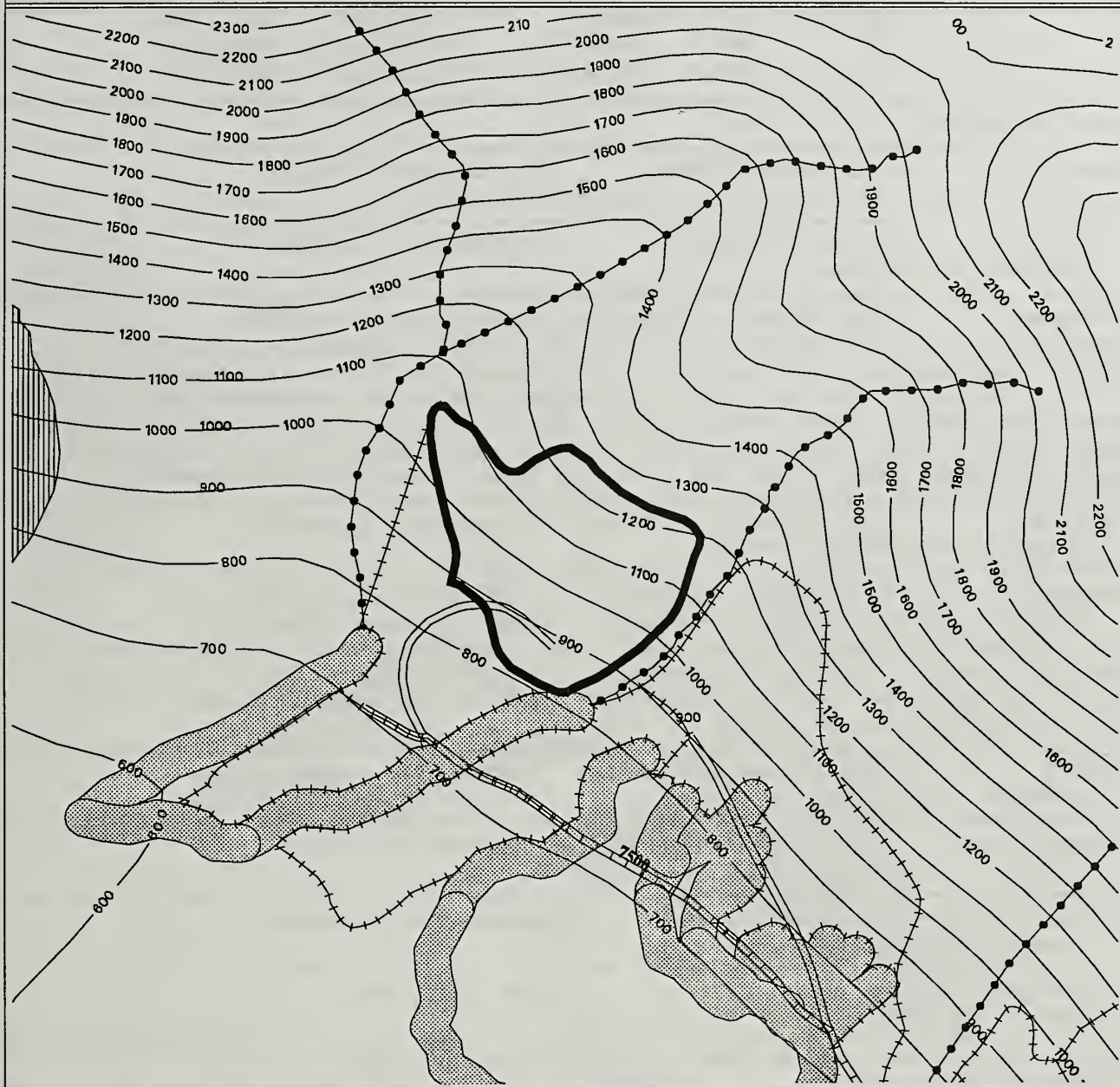
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	133	Helicopter	Group Selection
C	80	597	Cable	Overstory Removal
D	90	597	Cable	Clearcut w/ retention
F	90	597	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a on lower SE corner. See hydrology for additional remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class III stream for cc alt. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: M.REGAN	APPROVED BY: M.REGAN
REMARKS: Additional landings in NW corner may be needed.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: Buffers and unharvested areas will provide suitable travel corridors. REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2041 UNIT NUMBER: 62610 QUAD(s): SITD5NE
 ACRES: 34 Unit 62610 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 62611
ACRES: 19.9

VCU: 2041
VOLUME (MBF): 722

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	144	Helicopter	Group Selection
C	90	649	Shovel	Clearcut w/ retention
D	90	649	Shovel	Clearcut w/ retention
F	90	649	Shovel	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams, including AF1 and MM1 channels on SE and SW boundaries. Maintain min. 100-ft buffer on Class II, Category A streams (BMP 12.6a). Recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm. Protect deeply incised class III, category B, HC channel (upstream of MM1) as per BMP 13.16 (and 13.3). Leave windfirm boundary .

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class II streams. (Feathering) (BMP 12.6a; 13.16). Windfirm boundaries can be established by feathering buffer or by harvesting trees with 2/3 or more of length above slope break to stream channel. Northwest winds can be severe along the vortex ridge sideslope. Northerlies can be funneled through the gorge section of upper Freshwater Valley.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

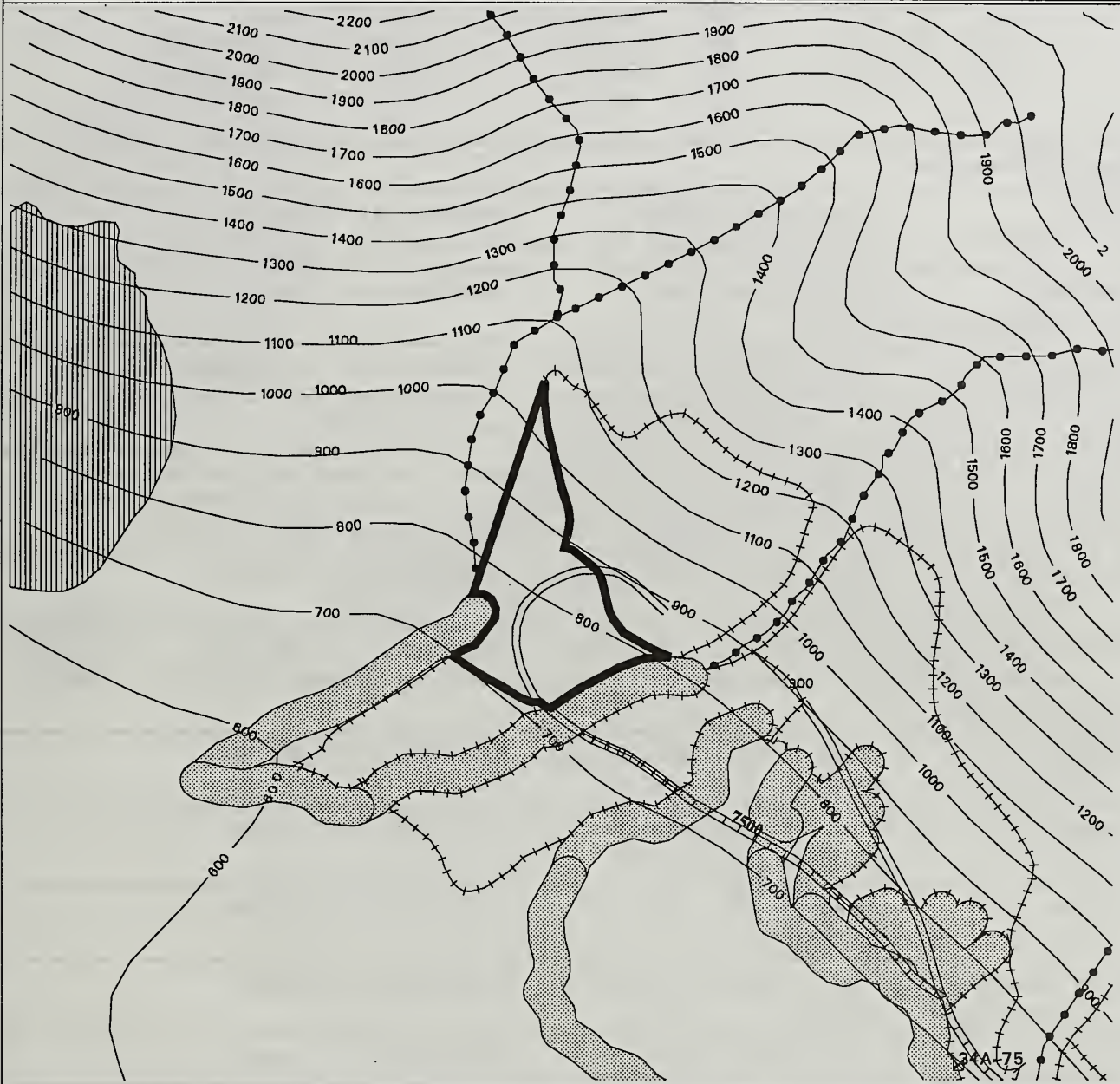
{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Buffers and unharvested areas will provide suitable travel corridors. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD PLANNED HARVEST UNIT MAP

VCU: 2041 UNIT NUMBER: 62611 QUAD(s): SITD5NE
 ACRES: 20 Unit 62611 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 62620
ACRES: 10.8

VCU: 2041
VOLUME (MBF): 412

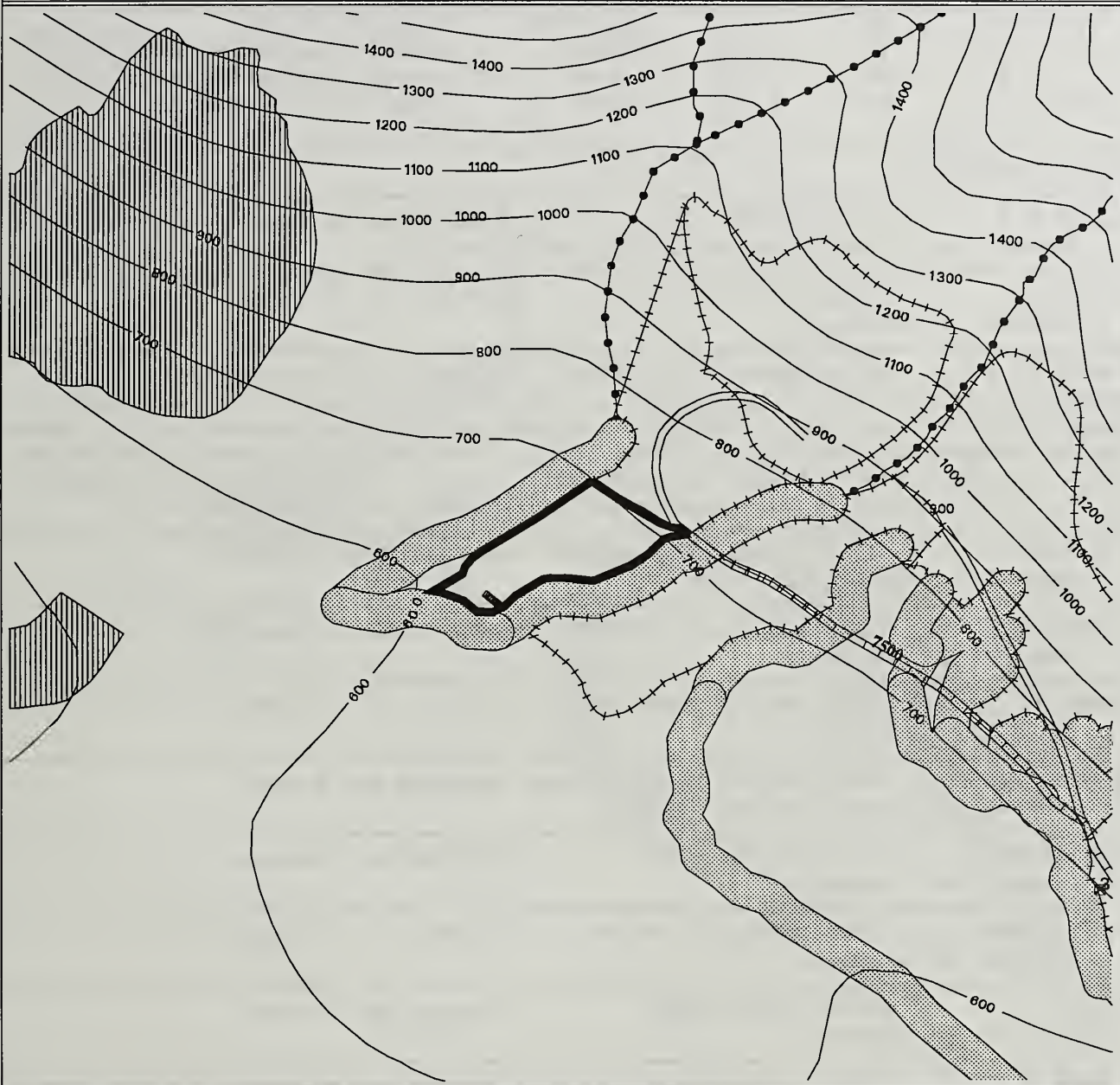
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	82	Helicopter	Group Selection
C	20	82	Shovel	Single Tree Selection
D	20	82	Shovel	Single Tree Selection
F	80	330	Shovel	Overstory Removal

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along all but the upper NE boundary. This includes MM1 channels along NW and SW boundaries and AF1 channel along SE boundary. Maintain windfirm (minimum of 100 ft) buffer on class I and II, category A stream(s) as per BMP 12.6a. If >60% harvest, recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundaries to class II streams for OR alt. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: M.REGAN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: When using overstory removal harvest system, implement W/L marten S&G XVI.A.2.c).		

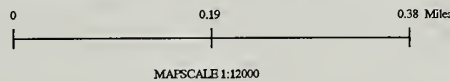
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2041 UNIT NUMBER: 62620 QUAD(s): SITD5NE
 ACRES: 11 Unit 62620 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL



- UNIT BOUNDARY
- ADJACENT UNIT
- NEW SPEC. ROAD
- TEMPORARY ROAD
- EXISTING SPEC. ROAD
- CLASS II STREAM
- CLASS III STREAM

- PHOTO POINT +
- EAGLE TREE ↑
- EXISTING CLEARCUTS
- SALTWATER AND LAKES
- CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 62630
ACRES: 15.3

VCU: 2041
VOLUME (MBF): 582

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	116	Helicopter	Group Selection
C	20	116	Shovel	Single Tree Selection
D	20	116	Shovel	Single Tree Selection
F	40	233	Shovel	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams along all but the uphill NE boundary. This includes an AF1 channel on the NW boundary and a smaller palustrine (PAO)/ floodplain (FPO) channel along the SE boundary. Maintain windfirm (min. 100 ft) buffer on class I and II, category A stream(s) (BMP 12.6a). Keep SW and SE boundaries uphill out of fen wetland areas (BMP 12.5).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Survey for active sharp-shinned hawk nest as funding allows. If active nest is located, implement W/L raptor nest S&G X.A.1-3.

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2041 UNIT NUMBER: 62630 QUAD(s): SITD5NE
 ACRES: 15 Unit 62630 Occurs in Alternatives: B C D F



UNIT BOUNDARY
 ADJACENT UNIT
 NEW SPEC. ROAD
 TEMPORARY ROAD
 EXISTING SPEC. ROAD
 CLASS II STREAM
 CLASS III STREAM

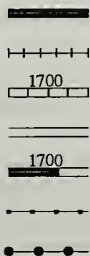


PHOTO POINT
 EAGLE TREE
 EXISTING CLEARCUTS
 SALTWATER AND LAKES
 CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 62640
ACRES: 8.8

VCU: 2041
VOLUME (MBF): 334

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	67	Helicopter	Group Selection
C	90	301	Cable	Clearcut w/ retention
D	90	301	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including an AF1 channel on the NW boundary and an FSO/PAO channel and adjacent wetland (fen) area along the SE boundary. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a; leave windfirm boundary on AF1 channel. Keep SE boundary out of wetland-fen area (BMP 12.5). Upstream of AF1 channel, protect the class III, category B, HC channel as per BMP 13.16 (and 13.3).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundaries to streams for Alternatives C and D. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend partial suspension.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: M.REGAN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2041 UNIT NUMBER: 62640 QUAD(s): SITD5NE
 ACRES: 9 Unit 62640 Occurs in Alternatives: B C D



UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM

100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles
 MAP SCALE 1:12000

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 62650
ACRES: 44.8

VCU: 2041/2160
VOLUME (MBF): 908

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	182	Helicopter	Group Selection
C	90	817	Cable	Clearcut w/ retention
D	90	817	Cable	Clearcut w/ retention
E	90	817	Cable	Clearcut w/ retention
F	90	817	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams all along lower SW and S boundaries. These include about 8 FSO (small footslope) channels, a palustrine (PAO) channel and an MMO and HC2 channel along the south corner. Keep lower unit boundary upstream of class I/II channels and fen wetland area (BMP 12.5). Maintain min. 100-ft buffer on Class II, Category A streams (BMP 12.6a). The upstream class III area of some of these channels, along with the HC channels on the NW and SE boundaries, are category B or C streams. Protect per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class III stream channel. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend partial suspension.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: Recommend partial suspension.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Survey for red-tailed hawk as funding allows. If active nest is located, implement W/L raptor nest S&G X.A.1-3. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

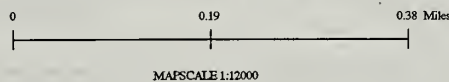
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2041/2160 UNIT NUMBER: 62650 QUAD(s): SITD5NE
 ACRES: 45 Unit 62650 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL



AREA LOCATOR



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 62710
ACRES: 20.9

VCU: 2160
VOLUME (MBF): 533

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	479	Cable	Clearcut w/ retention
C	90	479	Cable	Clearcut w/ retention
D	90	479	Cable	Clearcut w/ retention
E	90	479	Cable	Clearcut w/ retention
F	90	479	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: No concerns.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

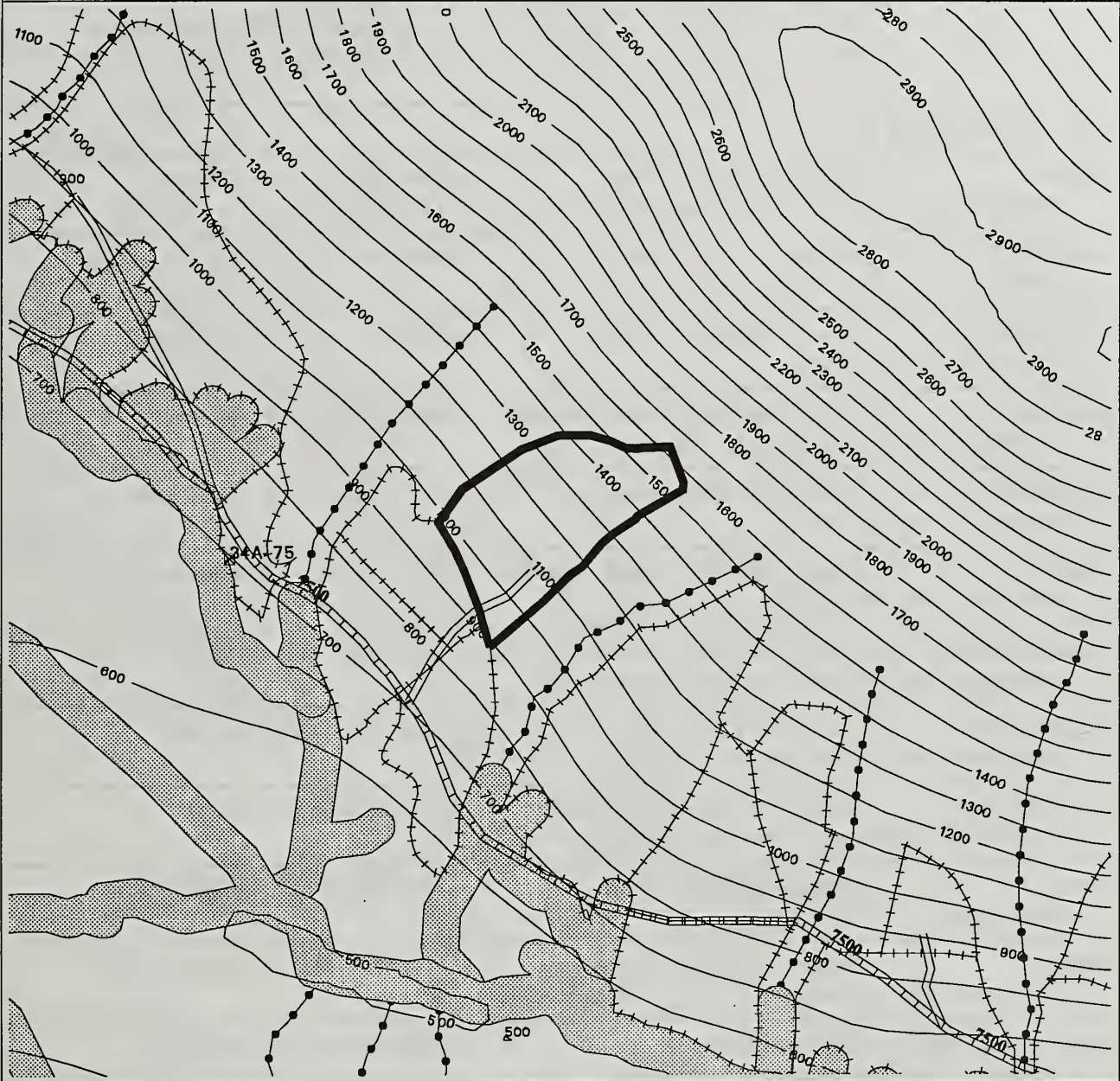
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Survey for raptor nest as funding allows. If active nest is located, implement W/L raptor nest S&G X.A.1-3.. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62710 QUAD(s): SITD5NE
 ACRES: 21 Unit 62710 Occurs in Alternatives: B C D E F



UNIT BOUNDARY
 ADJACENT UNIT
 NEW SPEC. ROAD
 TEMPORARY ROAD
 EXISTING SPEC. ROAD
 CLASS II STREAM
 CLASS III STREAM

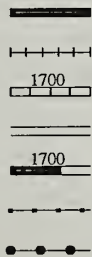
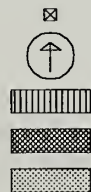


PHOTO POINT
 EAGLE TREE
 EXISTING CLEARCUTS
 SALTWATER AND LAKES
 CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 62720
ACRES: 9.2

VCU: 2160
VOLUME (MBF): 168

ALTERNATIVE SUMMARY

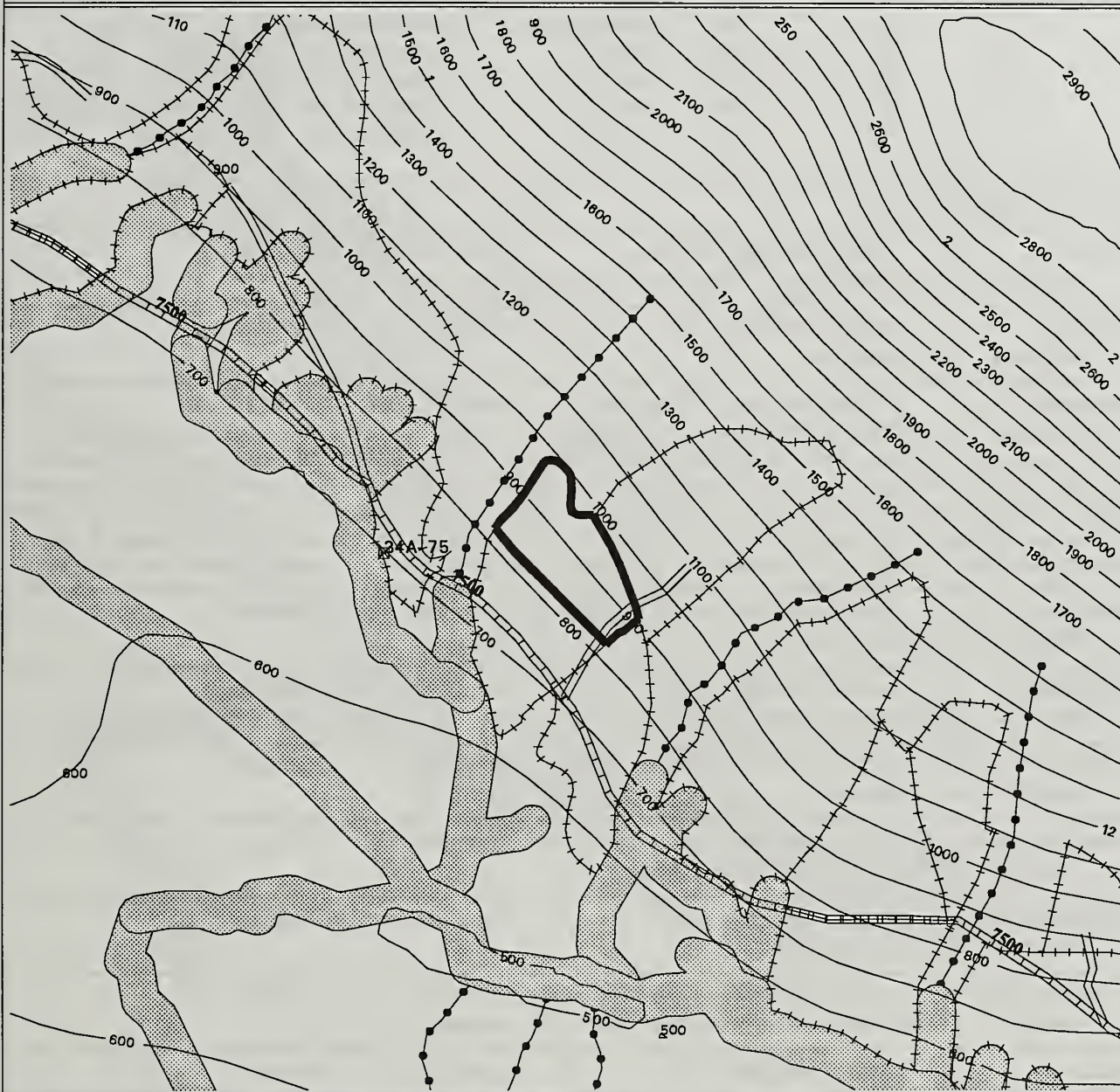
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	152	Cable	Clearcut w/ retention
E	90	152	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: No concerns.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: BMP 13.16.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend partial suspension.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS:When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62720 QUAD(s): SITD5NE
 ACRES: 9 Unit 62720 Occurs in Alternatives: B E



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 62730
ACRES: 12.2

VCU: 2160
VOLUME (MBF): 202

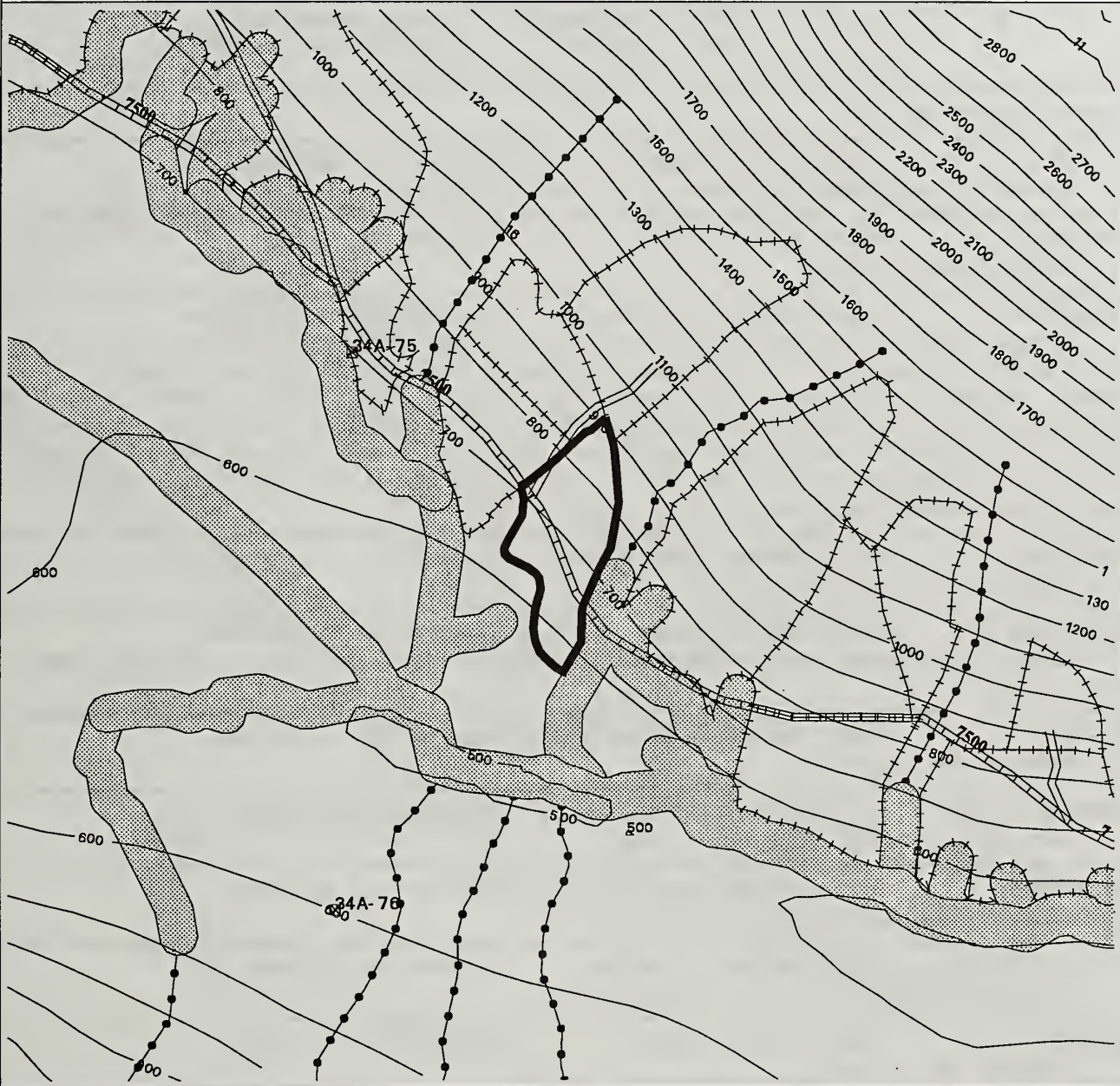
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	40	Helicopter	Group Selection
C	90	182	Cable	Clearcut w/ retention
D	90	182	Cable	Clearcut w/ retention
E	90	182	Cable	Clearcut w/ retention
F	90	182	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: S.JACOBSON	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along lower SE and SW boundaries. These include a small footslope (FSO) channel near the muskeg/fen areas and an HC2 channel along the SE boundary. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a. Keep unit above wetland-fen area on W side (BMP 12.5). Protect the class III, category B HC6 channel upstream of the HC2 channel as per BMP 13.16 (and 13.3). Leave windfirm boundary .		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class II stream. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend cable yarding, partial suspension.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS:When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62730 QUAD(s): SITD5NE
 ACRES: 12 Unit 62730 Occurs in Alternatives: B C D E F



AREA LOCATOR

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM

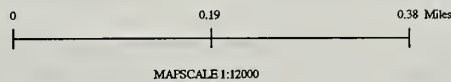
PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 62740 VCU: 2160
ACRES: 11.0 VOLUME (MBF): 194

		ALTERNATIVE SUMMARY		
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	39	Helicopter	Group Selection
E	90	175	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: S.JACOBSON	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including HC2 and MM1 channel along W boundary. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a. Keep unit above small wetland-fen area along SE boundary (BMP 12.5). Protect the class III, category B, HC6 channel upstream of the HC2 channel as per BMP 13.16 (and 13.3). Leave windfirm boundary by placing unit boundary at or above slope break of Class III channels (2/3 rule).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Implement BMPs. Recommend windfirm boundary to class II stream. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: B.DOUGAN	APPROVED BY: S.BEALL
REMARKS: Recommend partial suspension.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62740 QUAD(s): S1TD5NE
 ACRES: 11 Unit 62740 Occurs in Alternatives: B E



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 62810
ACRES: 31.2

VCU: 2160
VOLUME (MBF): 559

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	112	Helicopter	Group Selection
C	90	503	Cable/Helicopter	Clearcut w/ retention
D	90	503	Cable/Helicopter	Clearcut w/ retention
F	40	224	Cable/Helicopter	Patch Clearcut

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams, including two small footslope (FSO) channels along lower S boundary. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a. Protect class III, category B, HC6 channel along NW boundary as per BMP 13.16 (and 13.3). Recommend placing unit boundary at or above slope break of Class III channels (2/3 rule).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class III stream for Alternatives C and D. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend clearcut, partial suspension.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

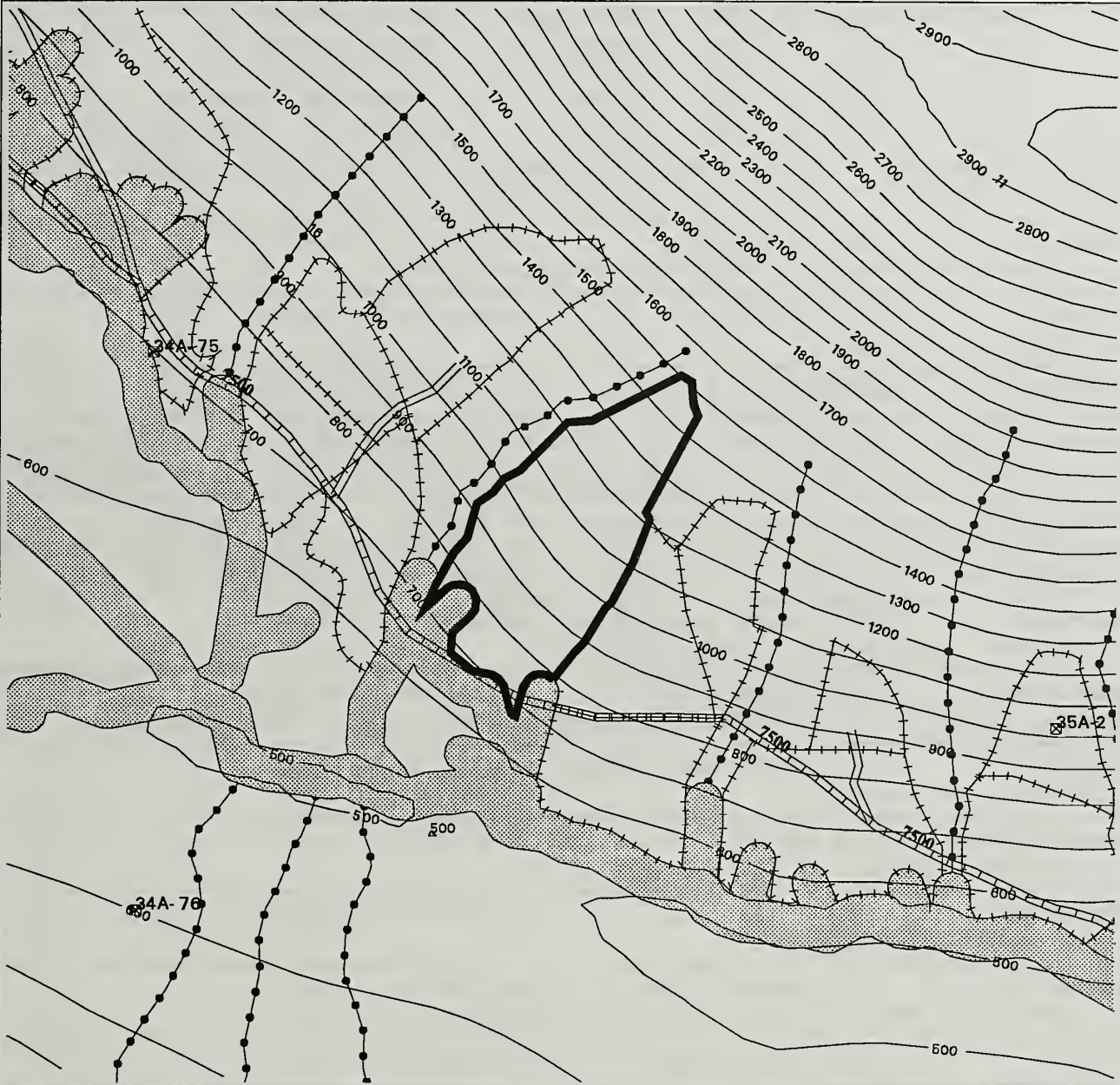
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62810 QUAD(s): SITD5NE
 ACRES: 31 Unit 62810 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 62820
ACRES: 14.2

VCU: 2160
VOLUME (MBF): 259

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	52	Helicopter	Group Selection
C	40	103	Cable	Patch Clearcut
D	40	103	Cable	Patch Clearcut
E	90	233	Cable	Clearcut w/ retention
F	90	233	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams, including MM2 valley bottom channel along lower S boundary, HC2 channel along SE boundary, and FSO channel along W boundary. Maintain windfirm (minimum of 100 ft) buffer on class I and II, category A stream(s) as per BMP 12.6a; recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm, along MM2 channel if harvest >60%. Protect class III, category B, HC6 channel upstream of the HC2 channel as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to streams for Alts. E and F. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend clearcut, partial suspension.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

VCU: 2160 UNIT NUMBER: 62820 QUAD(s): SITD5NE
 ACRES: 14 Unit 62820 Occurs in Alternatives: B C D E F

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM

100 FT CONTOUR INTERVAL

MAP SCALE 1:12000

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR

INDIAN RIVER UNIT CARD

UNIT: 62830
ACRES: 9.9

VCU: 2160
VOLUME (MBF): 171

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	34	Helicopter	Group Selection
E	80	137	Helicopter	Overstory Removal
F	80	137	Helicopter	Overstory Removal

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: See hydrology/soils for remarks.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class III stream for Overstory Removal alternative. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend overstory removal. V-notches. Recommend windfirm boundary.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on west side of unit and east side below brush field.

{ TIMBER } FIELD REVIEW: M.REGAN, S.GODFREY APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.

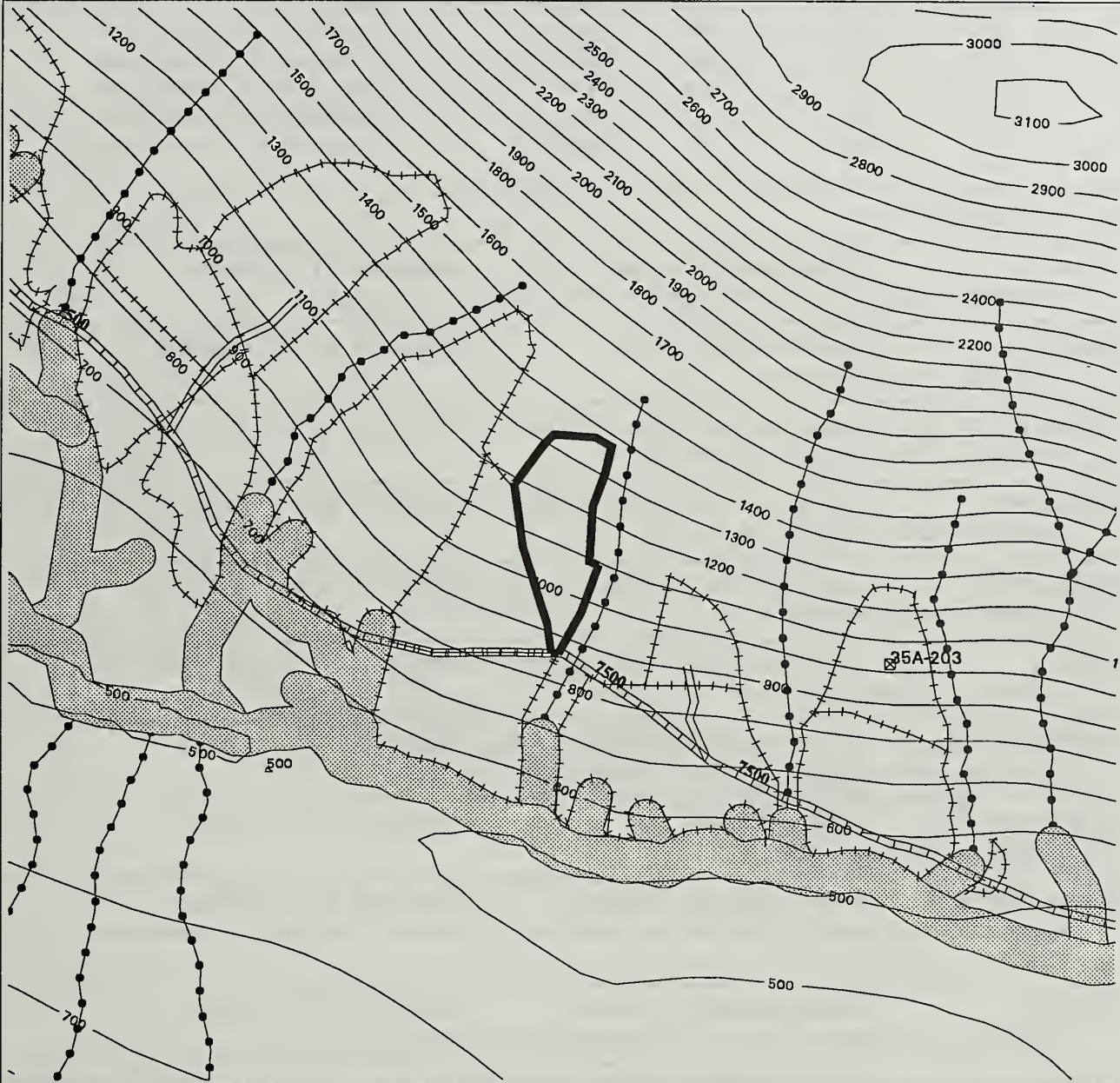
{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: When using overstory removal harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62830 QUAD(s): SITD5NE
ACRES: 10 Unit 62830 Occurs in Alternatives: B E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 62840

VCU: 2160

ACRES: 5.5

VOLUME (MBF): 100

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	90	Cable	Clearcut w/ retention
C	90	90	Cable	Clearcut w/ retention
D	90	90	Cable	Clearcut w/ retention
E	90	90	Cable	Clearcut w/ retention
F	90	90	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: See soils for remarks.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend clearcut or overstory removal; soil(s), v-notches, split yard, windfirm boundary.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Recommend partial suspension to protect wet soils.

{ TIMBER } FIELD REVIEW: M.REGAN, S.GODFREY APPROVED BY: M.REGAN
REMARKS: Recommend clearcut, cable yarding.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

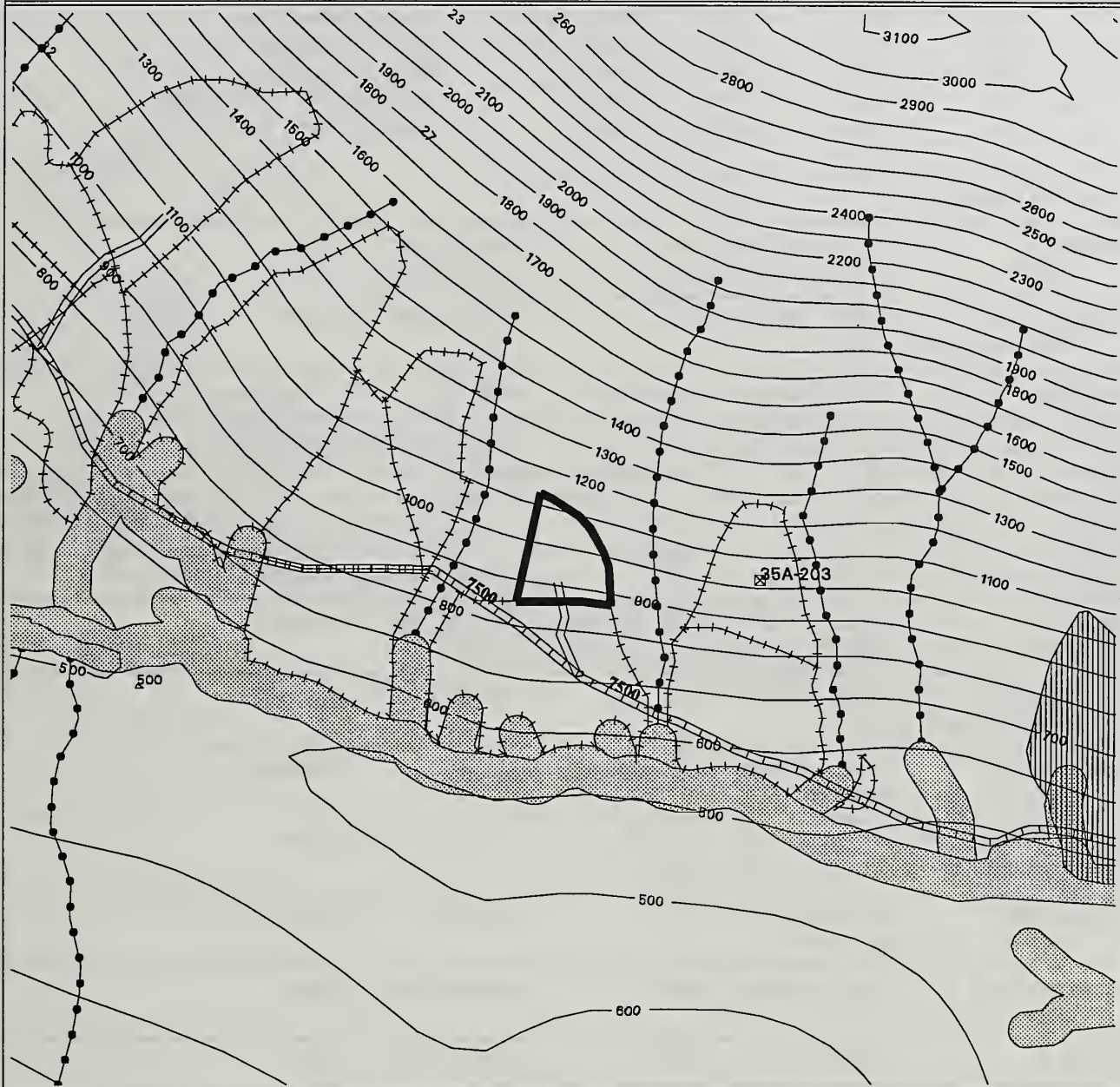
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

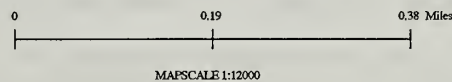
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62840 QUAD(s): SITD5NE/SITD4NW
 ACRES: 5 Unit 62840 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 62850
ACRES: 19.6

VCU: 2160
VOLUME (MBF): 357

ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	71	Helicopter	Group Selection
C	40	143	Cable	Patch Clearcut
D	40	143	Cable	Patch Clearcut
E	90	321	Cable	Clearcut w/ retention
F	40	143	Cable	Single Tree Selection

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: S.JACOBSON	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams along lower S boundary. These include 3 small footslope (FSO) channels along S boundary, and HC2 channels along the SE and SW corners. Maintain windfirm (min. 100 ft) buffer on class I and II, category A stream(s) (BMP 12.6a). For harvest >60%, recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm. HC5 and HC6 channels on upstream E and W boundaries are class III, category B streams. Protect as per BMP 13.16 (and 13.3).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: Split-yard v-notch in middle of unit.		
{ TIMBER }	FIELD REVIEW: M.REGAN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

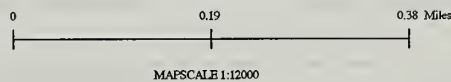
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62850 QUAD(s): SITD5NE/SITD4NW
 ACRES: 20 Unit 62850 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL



AREA LOCATOR



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 62860
ACRES: 13.7

VCU: 2160
VOLUME (MBF): 250

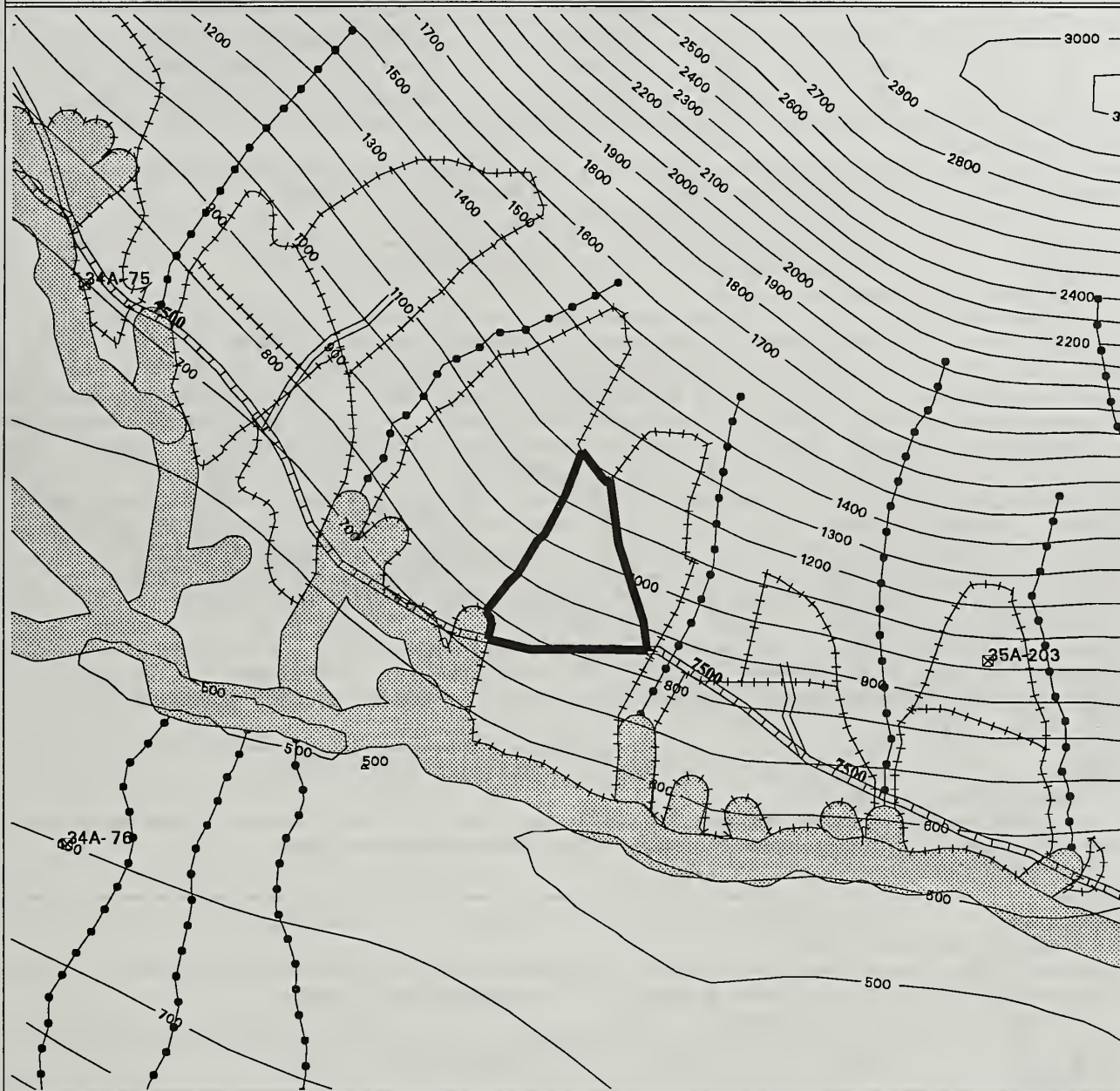
ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	50	Helicopter	Group Selection
C	90	225	Cable/Helicopter	Clearcut w/ retention
D	90	225	Cable/Helicopter	Clearcut w/ retention
E	90	225	Cable/Helicopter	Clearcut w/ retention
F	90	225	Cable/Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: S.JACOBSON	APPROVED BY: G.KILLINGER
REMARKS: Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a on small footslope channel (FSO) at SW corner. Upstream, this channel is class III, category B and should be protected as per BMP 13.16 (and 13.3). Leave windfirm boundary ; recommend placing unit boundary at or above slope break of Class III channels (2/3 rule).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut, partial suspension.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary along east side of unit.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS:When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62860 QUAD(s): SITD5NE
 ACRES: 14 Unit 62860 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 63110

VCU: 2160

ACRES: 15.8

VOLUME (MBF): 288

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	58	Helicopter	Group Selection
C	90	259	Shovel	Clearcut w/ retention
D	90	259	Shovel	Clearcut w/ retention
E	90	259	Shovel	Clearcut w/ retention
F	90	259	Shovel	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL

REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY

REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER

REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams, including valley bottom MM2 channel, small footslope (FSO) channel and HC2 channel along lower S boundary. Maintain windfirm (min. 100 ft) buffer on class I and II, category A stream(s) (BMP 12.6a). For harvest >60%, recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm. HC5 & HC6 channels on upstream W & E boundaries are class III, category B streams. Protect per BMP 13.16 (and 13.3). Leave windfirm boundary; recommend placing unit boundary at or above slope break of Class III channels (2/3 rule) for HC channels.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO

REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER

REMARKS: Implement BMPs. Recommend windfirm boundary to streams for Alts C, F. (BMP 12.6a; 13.16).

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL

REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER

REMARKS: Vulnerability risk = None

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON

REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL

REMARKS: Recommend clearcut.

{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN

REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN

REMARKS: No concerns.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER

REMARKS: No concerns.

{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG

REMARKS: No concerns.

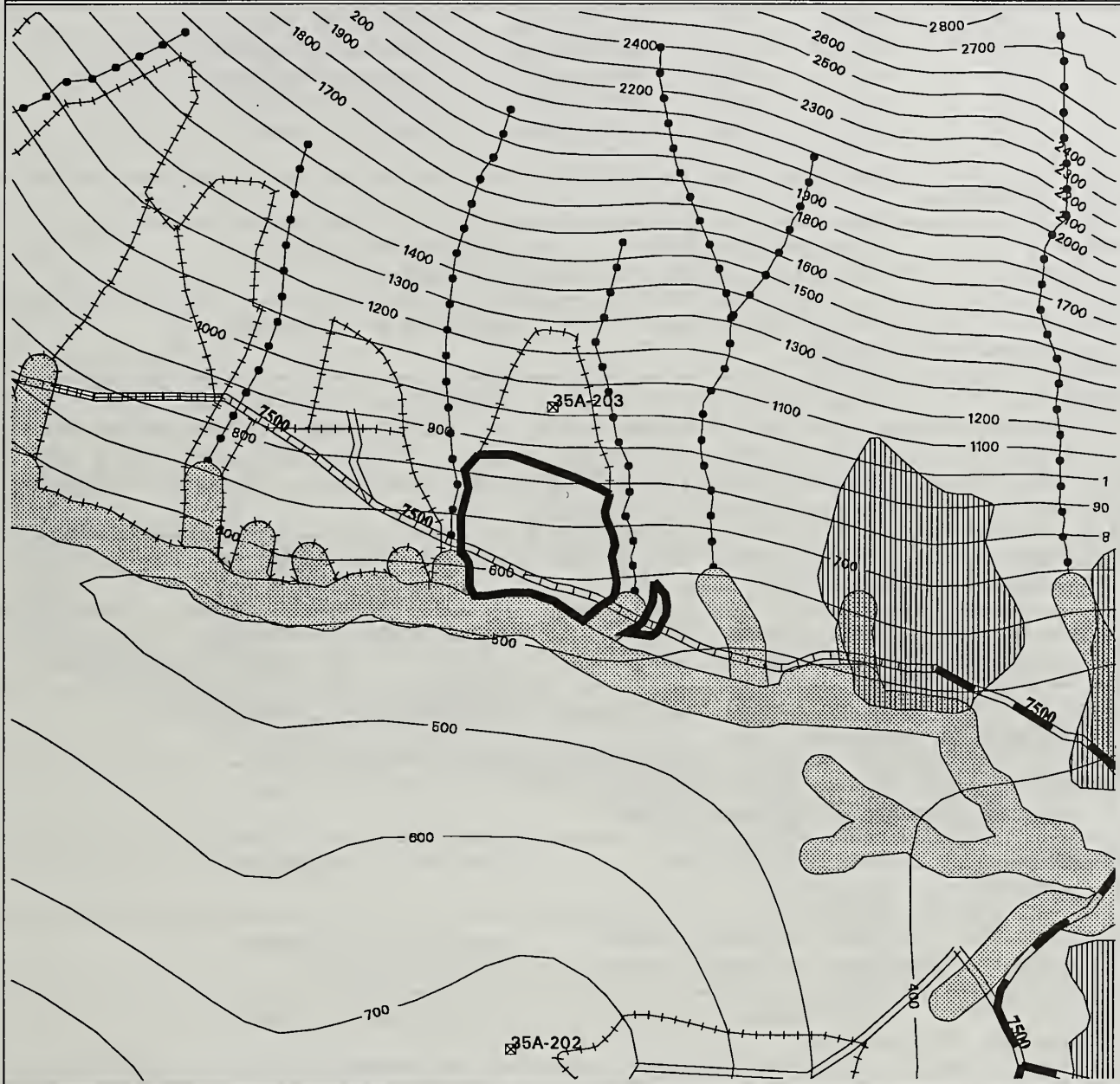
{ **WILDLIFE** } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY

REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

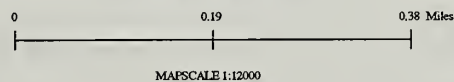
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63110 QUAD(s): SITD4NW
 ACRES: 16 Unit 63110 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 63120
ACRES: 10.2

VCU: 2160
VOLUME (MBF): 187

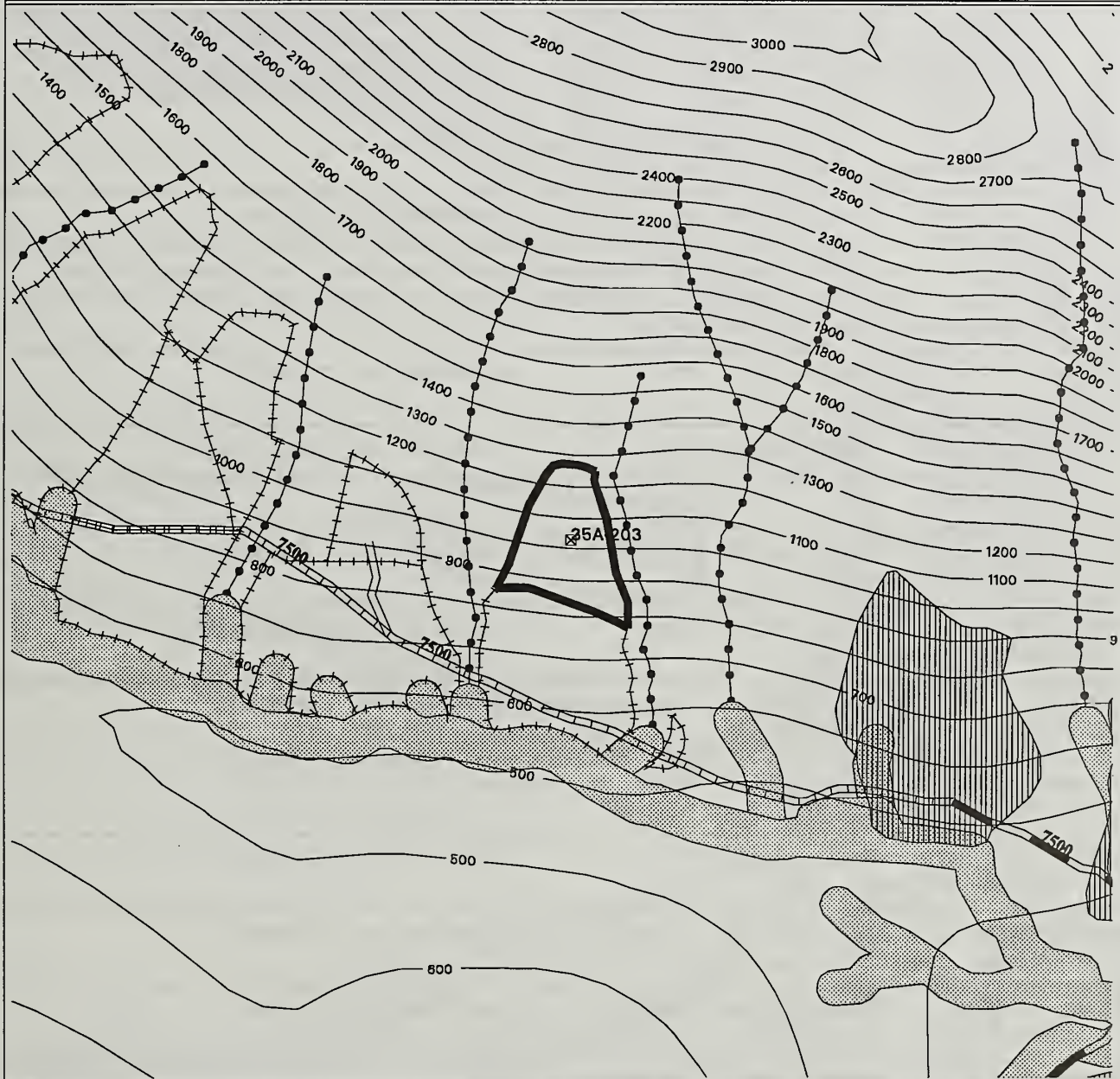
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	37	Helicopter	Group Selection
C	80	149	Helicopter	Overstory Removal
D	80	149	Helicopter	Overstory Removal
E	80	149	Helicopter	Overstory Removal
F	80	149	Helicopter	Overstory Removal

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: S.JACOBSON	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including HC2 and FSO channels along S half of small, west block. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a. Also, see hydrology remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class III stream. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend helicopter harvest, overstory removal.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: G.PETERSON, M.REGAN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using overstory removal harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63120 QUAD(s): SITD4NW
 ACRES: 10 Unit 63120 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 63510 VCU: 2160
ACRES: 18.8 VOLUME (MBF): 341

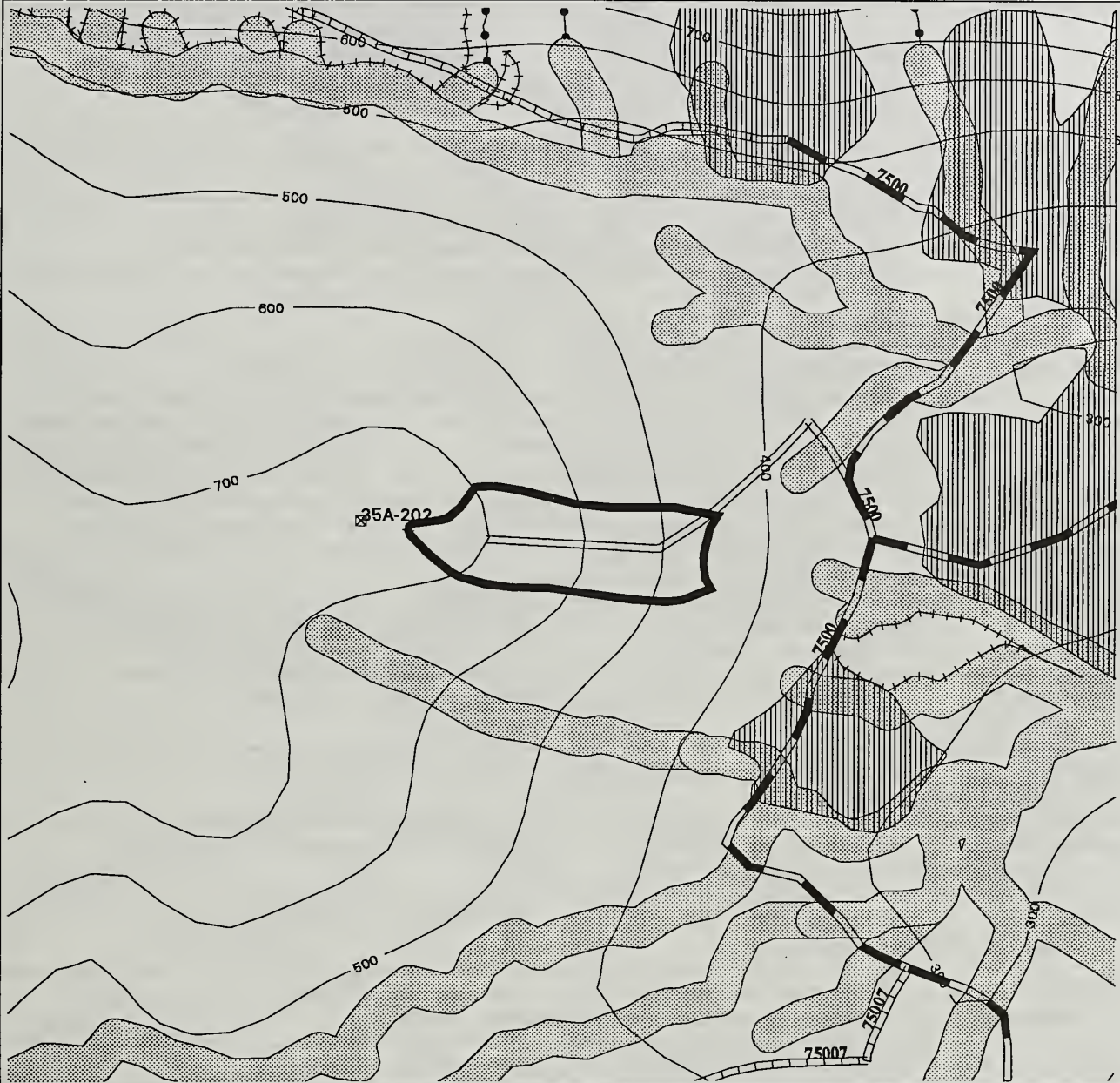
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	90	307	Cable	Clearcut w/ retention
D	90	307	Cable	Clearcut w/ retention
E	90	307	Cable	Clearcut w/ retention
F	90	307	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.SHEPARD	APPROVED BY: S.TRULL
REMARKS: Open forest/muskeg habitat; sensitive plants found in survey. Recommend placing reserves in swale areas with scattered sensitive plants and concentrating clearcuts in more productive timber. Recommend botanist present at layout, and with road locators for temporary road to unit.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: Keep unit out of wetland-fen areas along N, S, and W boundaries (BMP 12.5).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: Soils are too wet for shovel yarding; protect wet soils.		
{ TIMBER }	FIELD REVIEW: M.REGAN	APPROVED BY: M.REGAN
REMARKS: Recommend a track loader, swing yarder.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

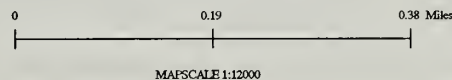
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

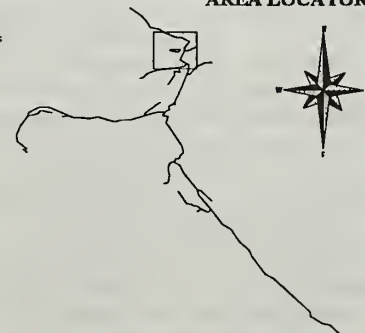
VCU: 2160 UNIT NUMBER: 63510 QUAD(s): SITD4NW
 ACRES: 19 Unit 63510 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL



AREA LOCATOR



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 63520

VCU: 2160

ACRES: 6.2

VOLUME (MBF): 136

ALTER-NATIVE	PERCENT HARVEST	ALTERNATIVE SUMMARY		
		HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	27	Cable	Patch Clearcut
C	50	68	Cable	Overstory Removal
D	50	68	Cable	Overstory Removal
E	20	27	Cable	Patch Clearcut
F	50	68	Cable	Overstory Removal

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPARD APPROVED BY: S.TRULL
REMARKS: Open forest/muskeg habitat. No sensitive plants found in survey.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams (class I), including main channel FP4 along SE corner, & smaller (FPO) floodplain channels which nearly surround the planned unit. Maintain windfirm (minimum of 100 ft) buffer on class I, category A stream(s) (BMP 12.6a). Implement 170 ft wide riparian conservation zones along FP4 channel. Windfirmness of stream buffers with large trees surrounded by old clearcuts is a concern. Limit harvest to $\leq 50\%$, and where possible, recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Plant spruce where necessary; feather buffers.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: G.PETERSON, S.GODFREY APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: No concerns.

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63520 QUAD(s): SITD4NW
 ACRES: 6 Unit 63520 Occurs in Alternatives: B C D E F



UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR

INDIAN RIVER UNIT CARD

UNIT: 63820
ACRES: 50.5

VCU: 2160
VOLUME (MBF): 875

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	175	Helicopter	Group Selection
C	90	788	Helicopter	Clearcut w/ retention
D	90	788	Helicopter	Clearcut w/ retention
F	90	788	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including small footslope (FSO) channels along lower W and SW boundaries. Maintain windfirm (minimum of 100 ft) buffer on class I and II, category A stream(s) as per BMP 12.6a, including along large, incised MC3 channel on N boundary. HC6 and FSO channels that are class III along N and W boundaries and within unit are category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary ; recommend placing unit boundary at or above slope break of Class III channels (2/3 rule) between two larger blocks. Keep lower W boundary of N block out of wetland-fen area (BMP 12.5).

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary on north side of class III stream. (BMP 12.6a; 13.16).

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Low/Moderate

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend helicopter or cable harvest, overstory removal or clearcut.

{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: J.STELICK APPROVED BY: M.REGAN
REMARKS: Recommend clearcut or group selection, helicopter harvest.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

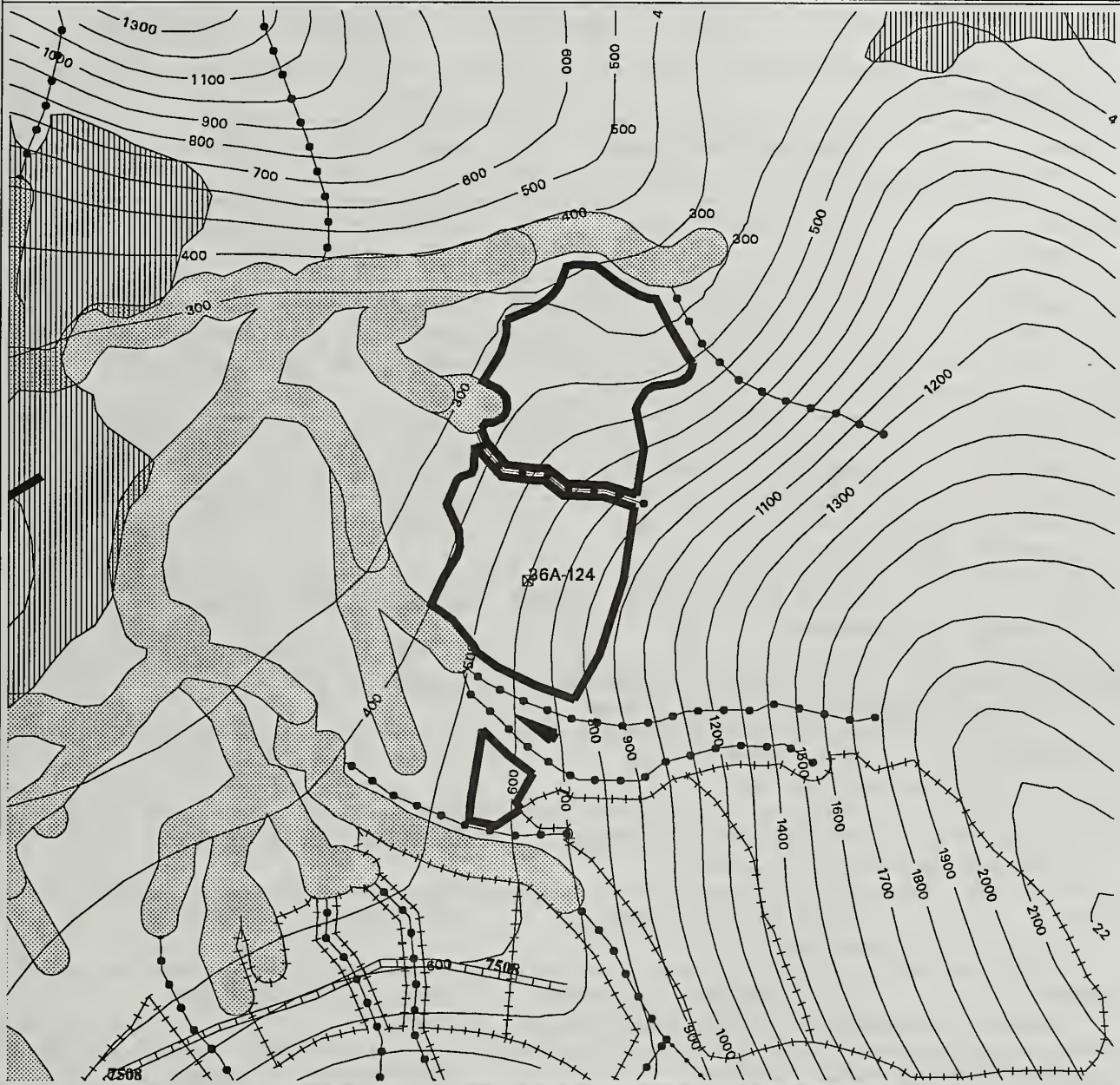
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63820 QUAD(s): SITD4NW
 ACRES: 51 Unit 63820 Occurs in Alternatives: B C D F



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



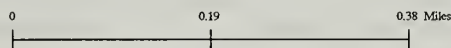
CLASS II STREAM



CLASS III STREAM



100 FT CONTOUR INTERVAL



MAP SCALE 1:12000

PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 63840
ACRES: 28.2

VCU: 2160
VOLUME (MBF): 814

		ALTERNATIVE SUMMARY		
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	732	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a along HC3 channel in lower SW corner. See hydrology for additional remarks.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a; 13.16.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend clearcut.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Recommend clearcut, helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

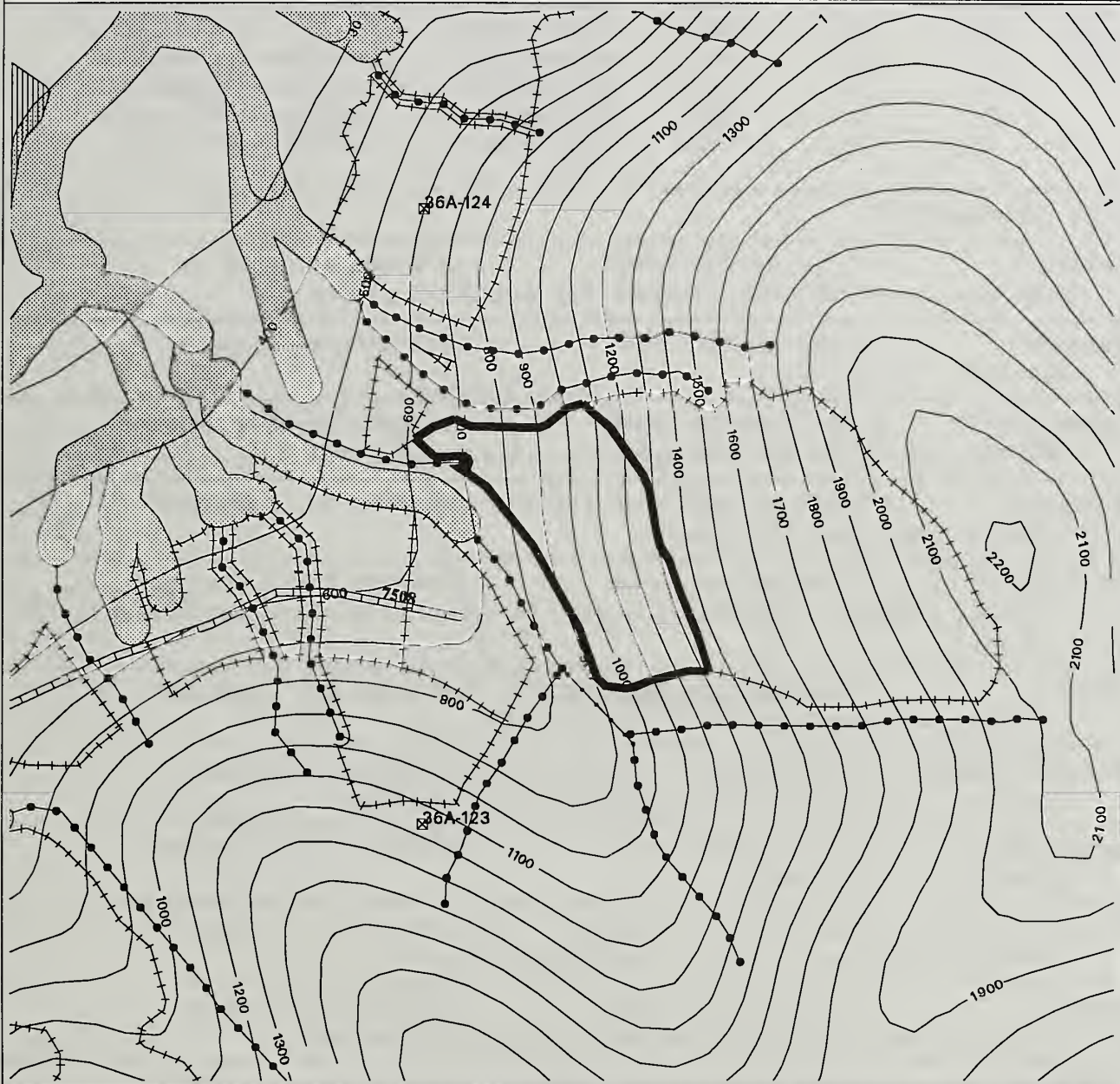
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

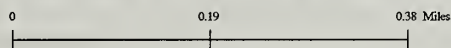
INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63840 QUAD(s): SITD4NW
 ACRES: 28 Unit 63840 Occurs in Alternatives: B



100 FT CONTOUR INTERVAL



MAP SCALE 1:12000

AREA LOCATOR



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 63850
ACRES: 63.6

VCU: 2160
VOLUME (MBF): 1618

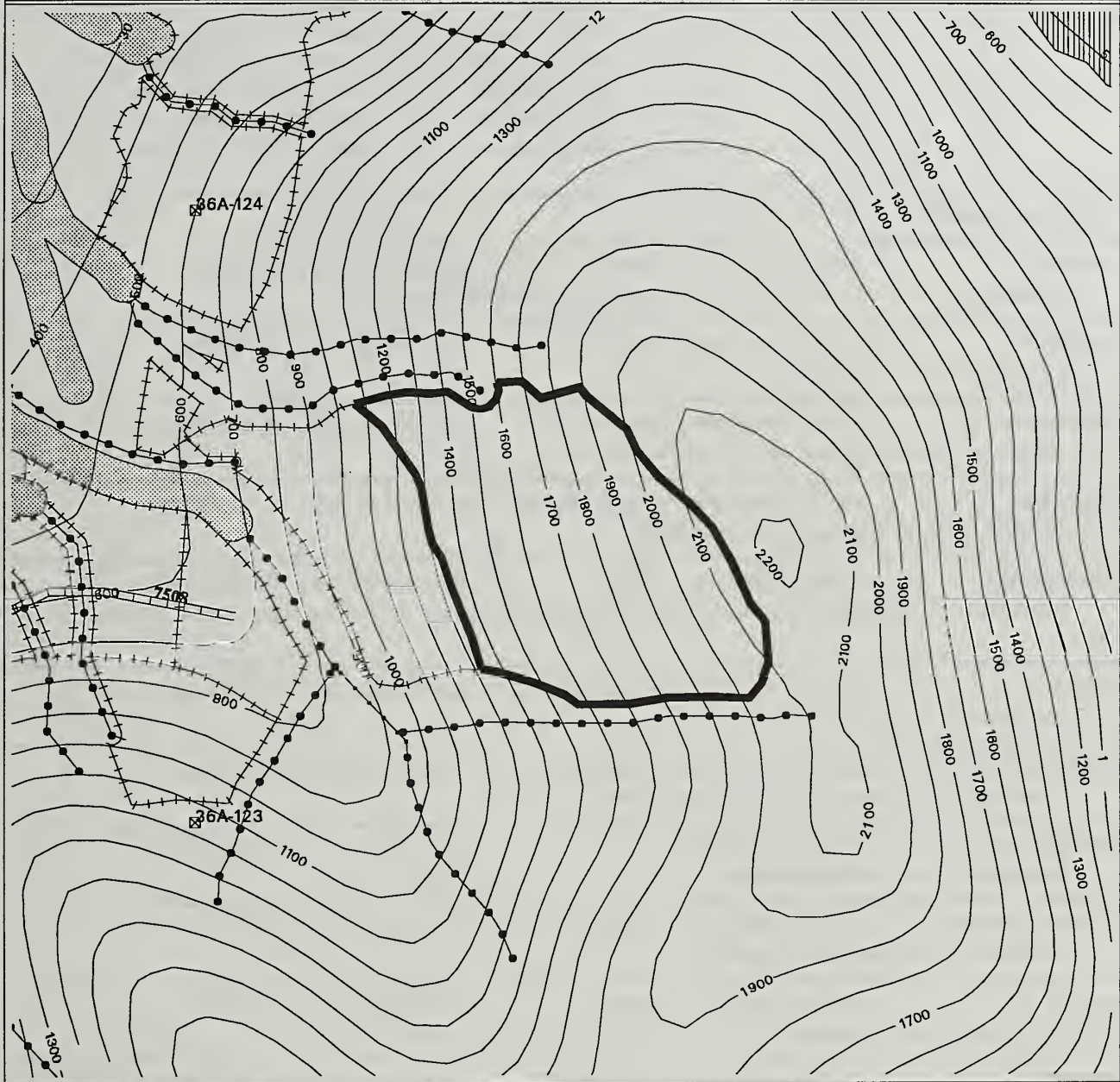
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	1456	Helicopter	Clearcut w/ retention
C	90	1456	Helicopter	Clearcut w/ retention
D	90	1456	Helicopter	Clearcut w/ retention
E	90	1456	Helicopter	Clearcut w/ retention
F	90	1456	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: See soils and hydrology for remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to south side class III stream. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate/High		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut, helicopter harvest.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on south side of unit.		
{ TIMBER }	FIELD REVIEW: S.GODFREY	APPROVED BY: M.REGAN
REMARKS: Recommend clearcut, helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63850 QUAD(s): SITD4NW
 ACRES: 64 Unit 63850 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 63920
ACRES: 14.1

VCU: 2160
VOLUME (MBF): 257

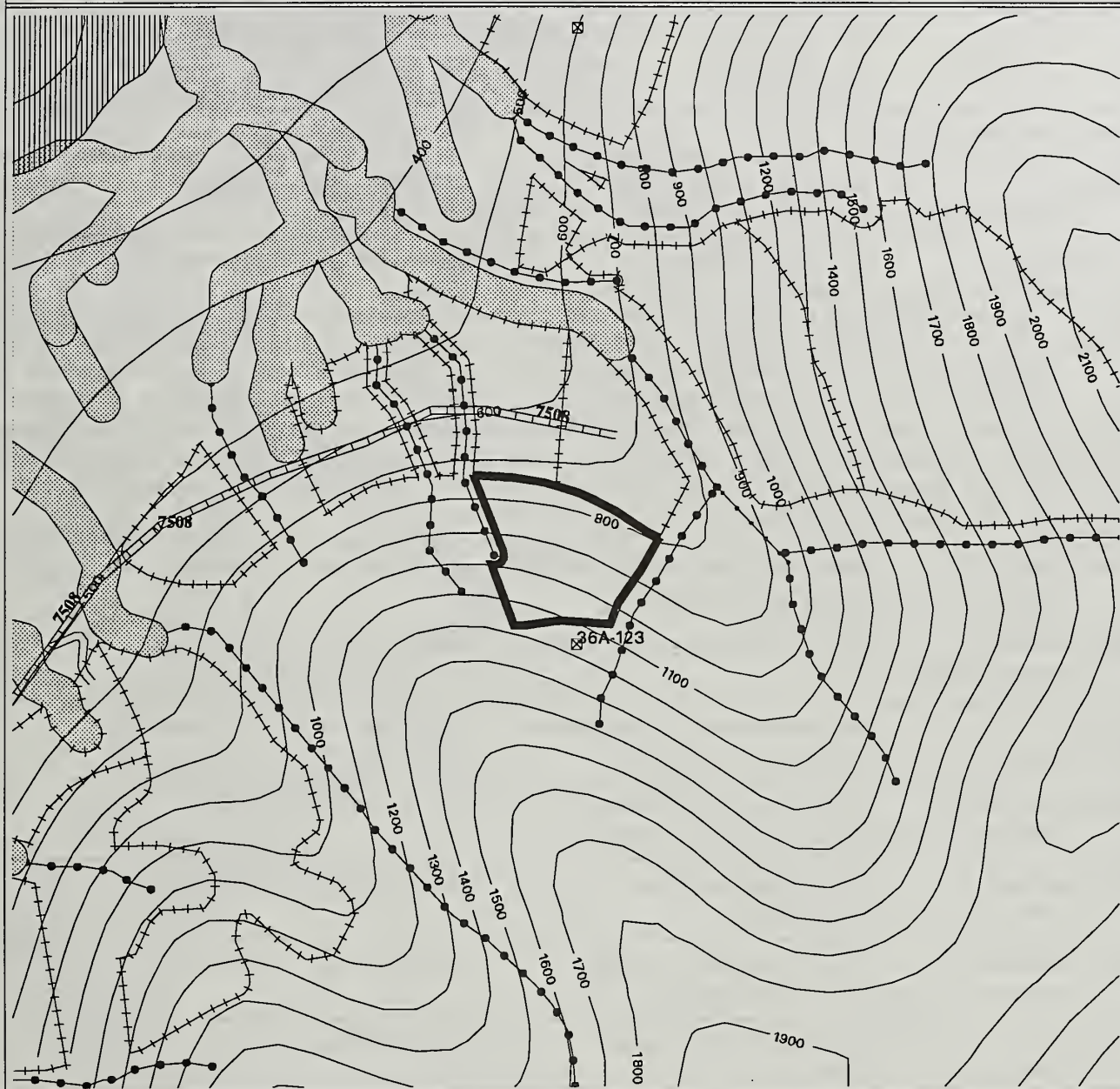
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	231	Helicopter	Clearcut w/ retention
C	90	231	Helicopter	Clearcut w/ retention
D	90	231	Helicopter	Clearcut w/ retention
E	90	231	Helicopter	Clearcut w/ retention
F	90	231	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: See hydrology for remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class III streams (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: S.GODFREY	APPROVED BY: M.REGAN
REMARKS: Recommend clearcut.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63920 QUAD(s): SITD4NW
 ACRES: 14 Unit 63920 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 63940

VCU: 2160

ACRES: 9.2

VOLUME (MBF): 141

ALTERNATIVE SUMMARY

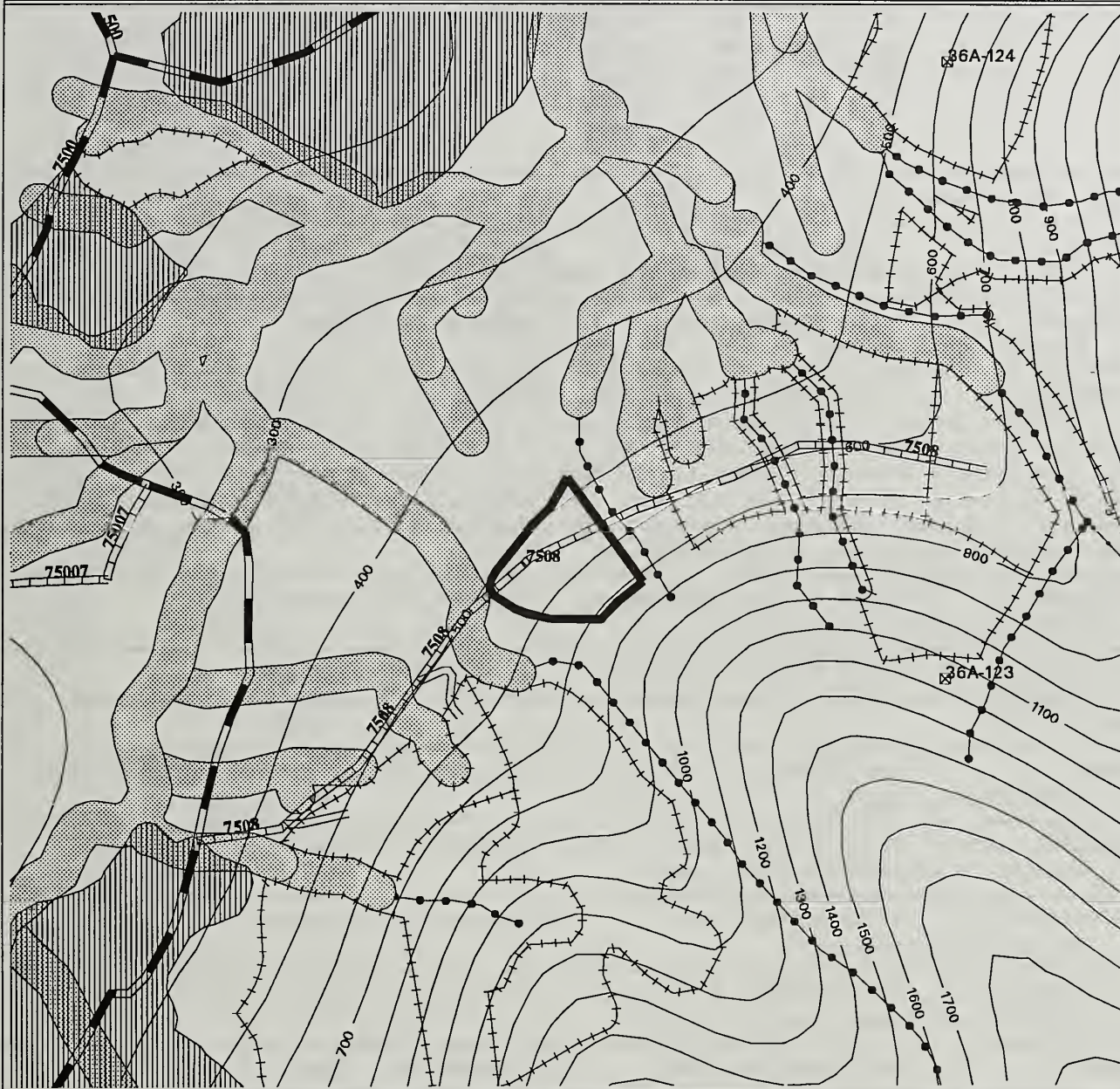
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	28	Helicopter	Group Selection
E	90	127	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including MM1 channel along SW boundary and FSO channels near the NE boundary. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a. Keep unit uphill of wetland-fen area along lower NW boundary (BMP 12.5). Protect class III, category B segment of FSO channel on NE boundary as per BMP 13.16 (and 13.3).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: BMP 13.16.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: G.PETERSON	APPROVED BY: M.REGAN
REMARKS: Recommend cable yarding, clearcut.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: L.SHIPLEY	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63940 QUAD(s): SITD4NW
 ACRES: 9 Unit 63940 Occurs in Alternatives: B E



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 63960
ACRES: 12.3

VCU: 2160
VOLUME (MBF): 209

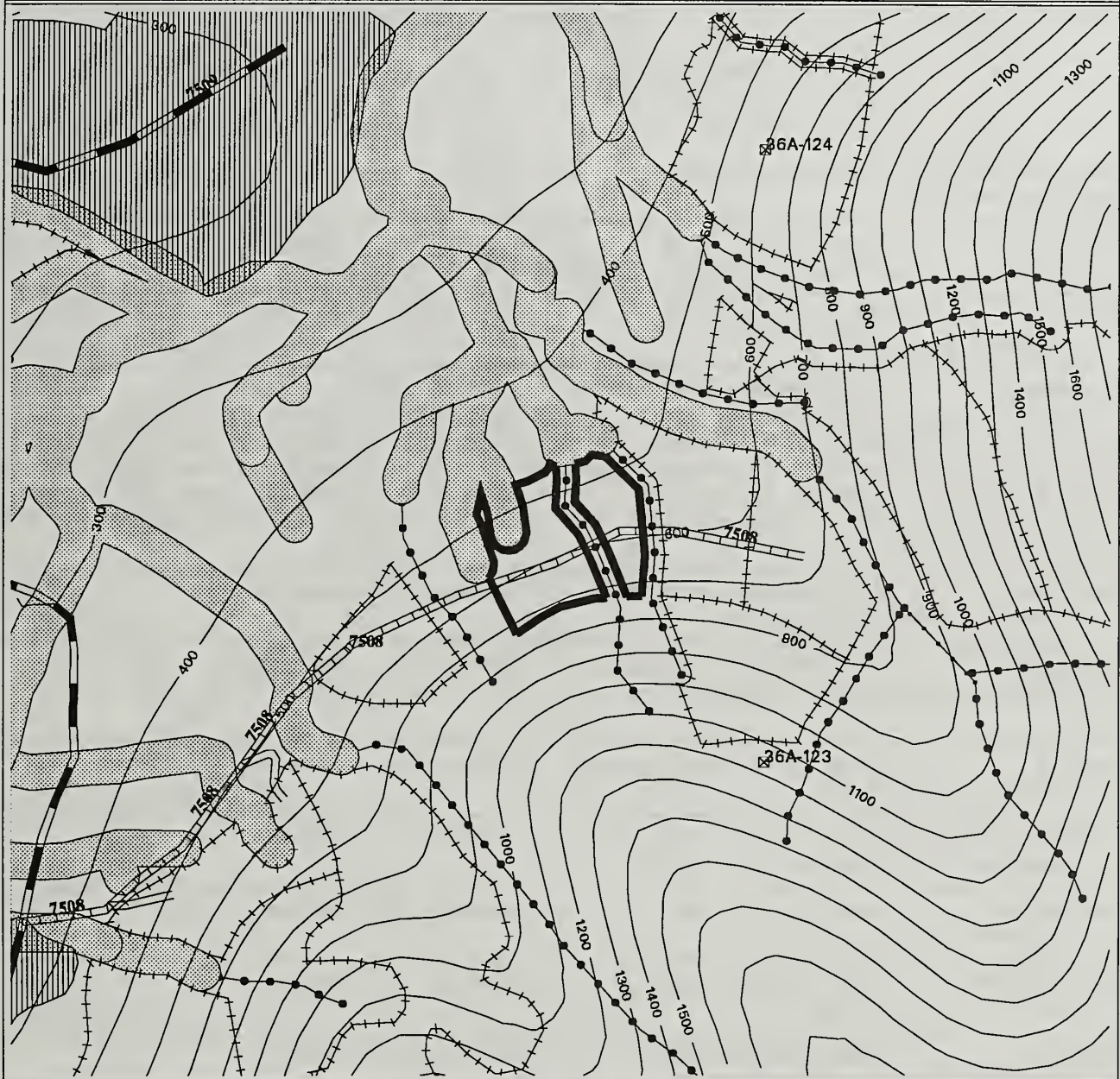
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	42	Helicopter	Group Selection
C	90	188	Cable	Clearcut w/ retention
D	90	188	Cable	Clearcut w/ retention
E	90	188	Cable	Clearcut w/ retention
F	90	188	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including 5 small footslope (FSO) channels along and within the lower N boundary of both blocks. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a. Keep lower unit boundary uphill of class II, FSO channels in NW corner. Upstream, where FSO channels become class III, protect the category B and C streams as per BMP 13.16 (and 13.3).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary on north side of central class III stream. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: G.PETERSON, M.REGAN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: L.SHIPLEY	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63960 QUAD(s): SITD4NW
 ACRES: 12 Unit 63960 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 63970
ACRES: 12.7

VCU: 2160
VOLUME (MBF): 284

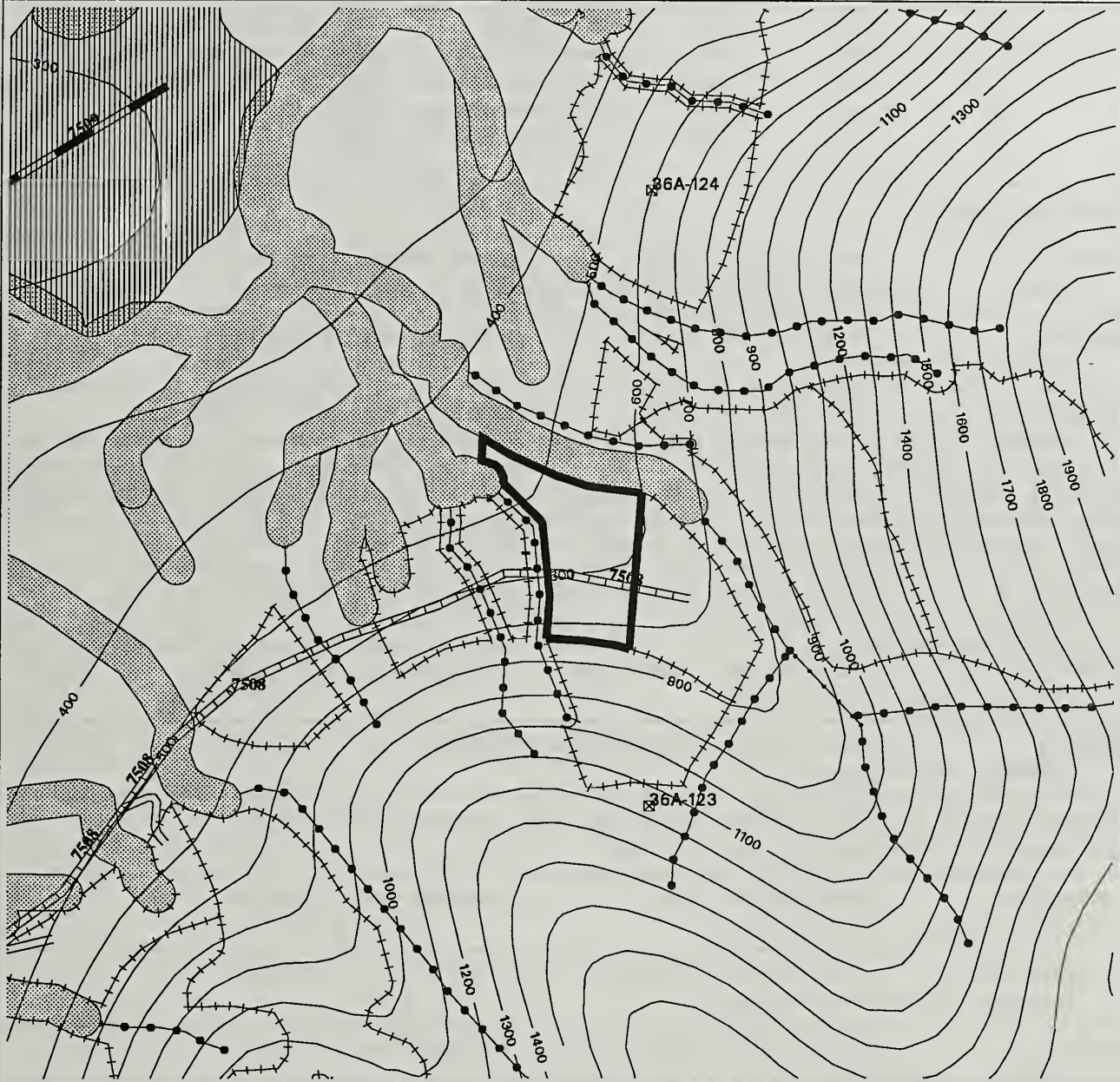
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	57	Helicopter	Group Selection
C	90	256	Cable	Clearcut w/ retention
D	90	256	Cable	Clearcut w/ retention
E	90	256	Cable	Clearcut w/ retention
F	90	256	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a for HC3 channel on N boundary and FSO channels on NW boundary. Leave windfirm boundary; recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm, along HC3 channel (if harvest >60%). Protect smaller, class III category B HC0 channel on W boundary as per BMP 13.16 (and 13.3).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class III stream (west side) (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on west side of unit.		
{ TIMBER }	FIELD REVIEW: G.PETERSON	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: L.SHIPLEY	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63970 QUAD(s): SITD4NW
 ACRES: 13 Unit 63970 Occurs in Alternatives: B C D E F



UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

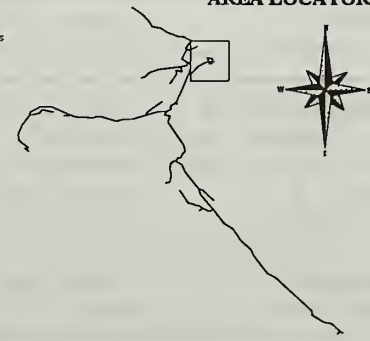
EAGLE TREE

EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 63971

VCU: 2160

ACRES: 11.9

VOLUME (MBF): 317

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	63	Helicopter	Group Selection
C	90	286	Cable/Helicopter	Clearcut w/ retention
D	90	286	Cable/Helicopter	Clearcut w/ retention
E	90	286	Cable/Helicopter	Clearcut w/ retention
F	90	286	Cable/Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a on lower NE corner adjacent to HC3 channel. Leave windfirm boundary; recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm, along channel buffer if harvest >60%. Protect class III segment of category B, HC3 channel as per BMP 13.16 (and 13.3).

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a; 13.16.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend clearcut.

{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Specialist needed during layout.

{ **TIMBER** } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: Recommend clearcut.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

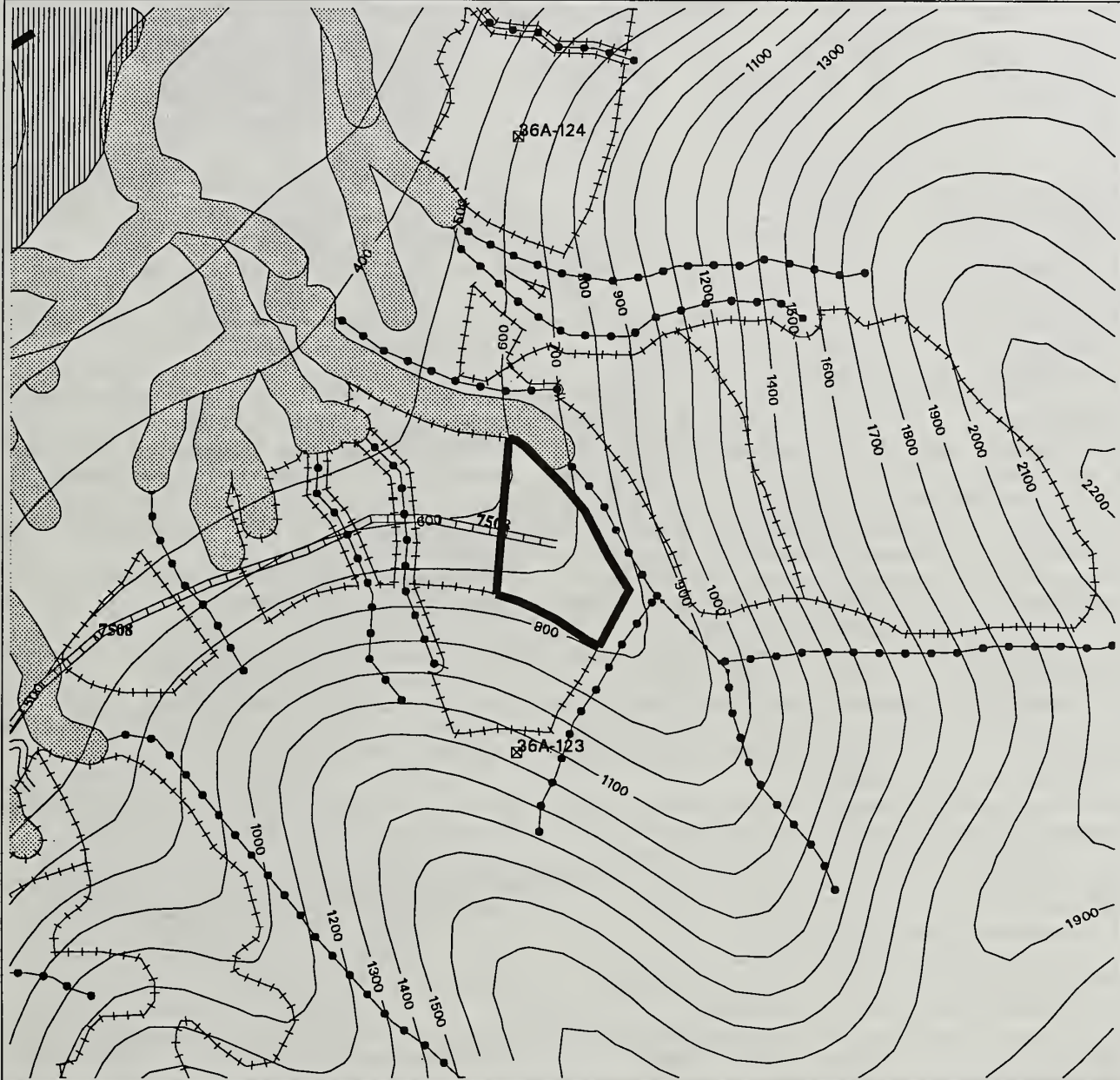
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: L.SHIPLEY APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63971 QUAD(S): SITD4NW
 ACRES: 12 Unit 63971 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



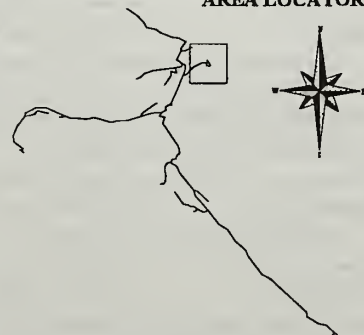
EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 64010
ACRES: 12.4

VCU: 2160
VOLUME (MBF): 217

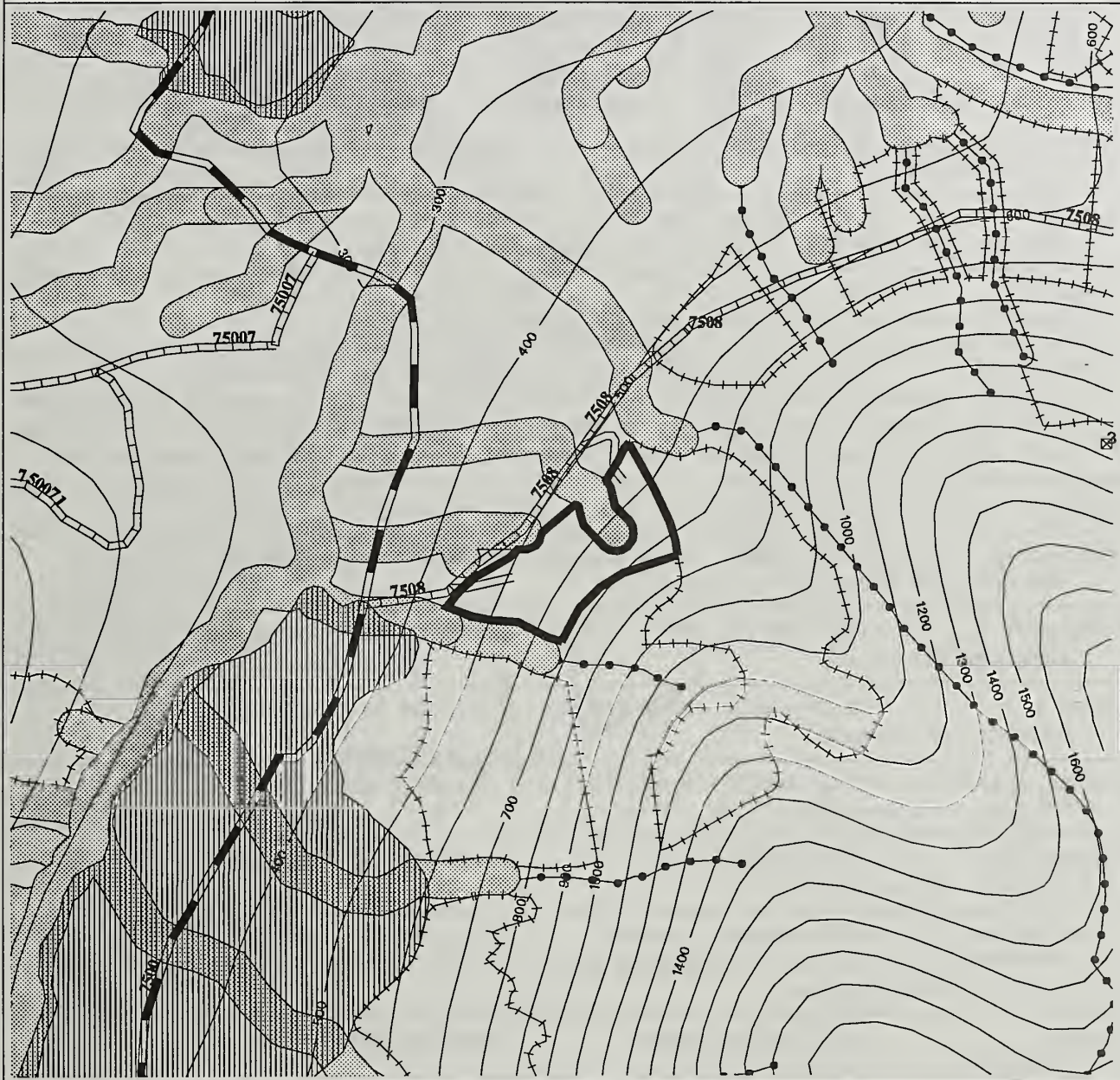
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	195	Helicopter	Clearcut w/ retention
C	90	195	Cable	Clearcut w/ retention
D	90	195	Cable	Clearcut w/ retention
E	90	195	Cable	Clearcut w/ retention
F	90	195	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.SHEPHARD	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants. Sensitive plants found outside unit in nearby muskegs.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including small footslope (FSO) channels along lower NW boundary and AF1/HC2 channel along S boundary. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a. Upstream in the unit, the FSO channels are class III, category C streams. Protect as per BMP 13.16 (and 13.3).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class II streams. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: M.REGAN	APPROVED BY: M.REGAN
REMARKS: Decadent stand. Recommend cable yarding, clearcut.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64010 QUAD(s): SITD4NW
 ACRES: 12 Unit 64010 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 64020
ACRES: 64.5

VCU: 2160
VOLUME (MBF): 966

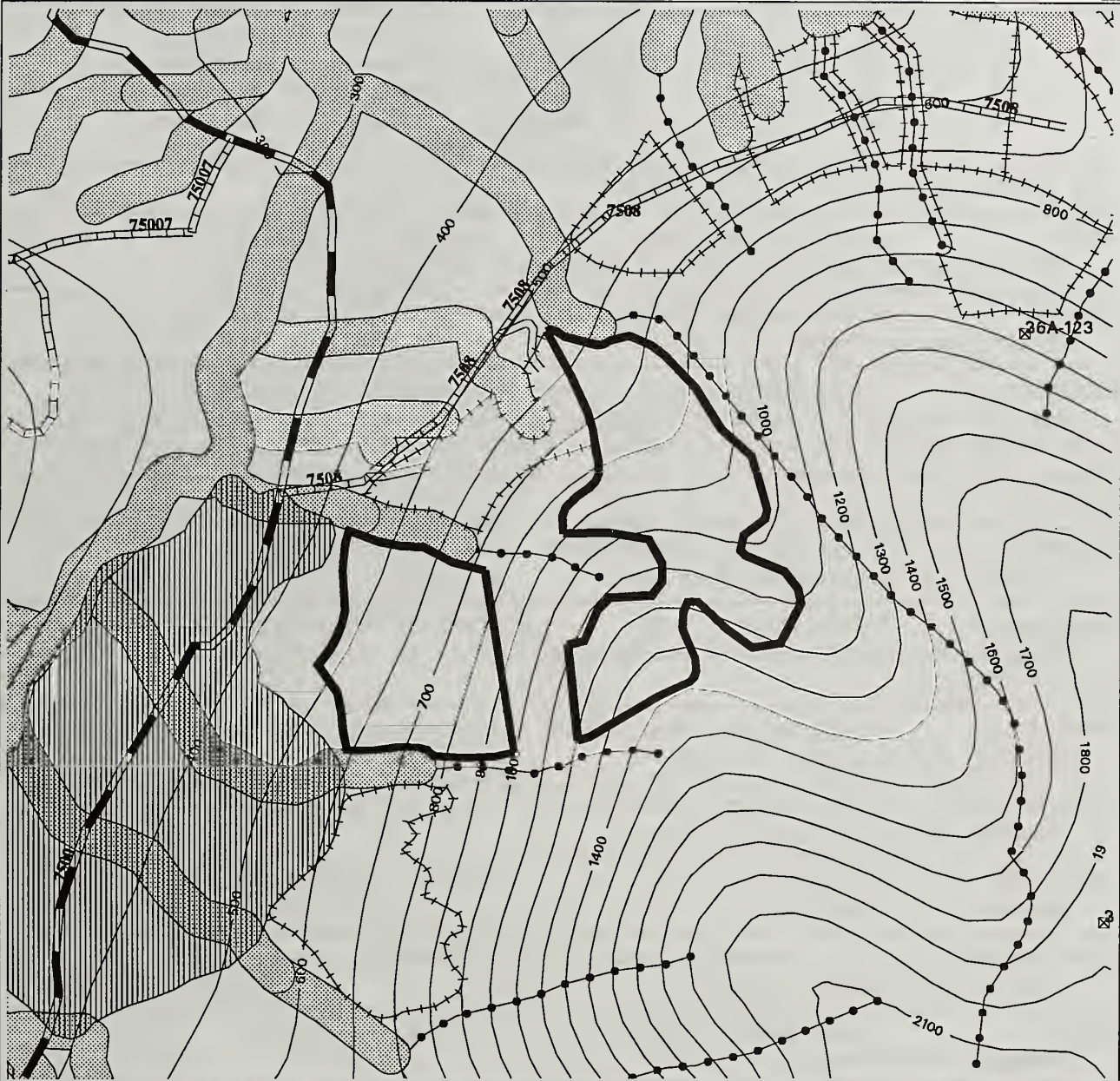
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	20	193	Helicopter	Group Selection
D	20	193	Helicopter	Group Selection
E	35	338	Helicopter	Patch Clearcut
F	35	338	Helicopter	Patch Clearcut

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a, along the HC2 channels on NW and SW boundaries of the most west block, and on the most N corner of the NE block, adjacent to the MM1 channel. Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams (class II). See hydrology for additional remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend group selection for 20% of volume due to numerous V-notches and highly dissected ground.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: G.PETERSON, M.REGAN	APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: Group selections will help maintain suitable old-growth characteristics.		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64020 QUAD(s): SITD4NW
 ACRES: 64 Unit 64020 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 64110
ACRES: 20.9

VCU: 2160
VOLUME (MBF): 321

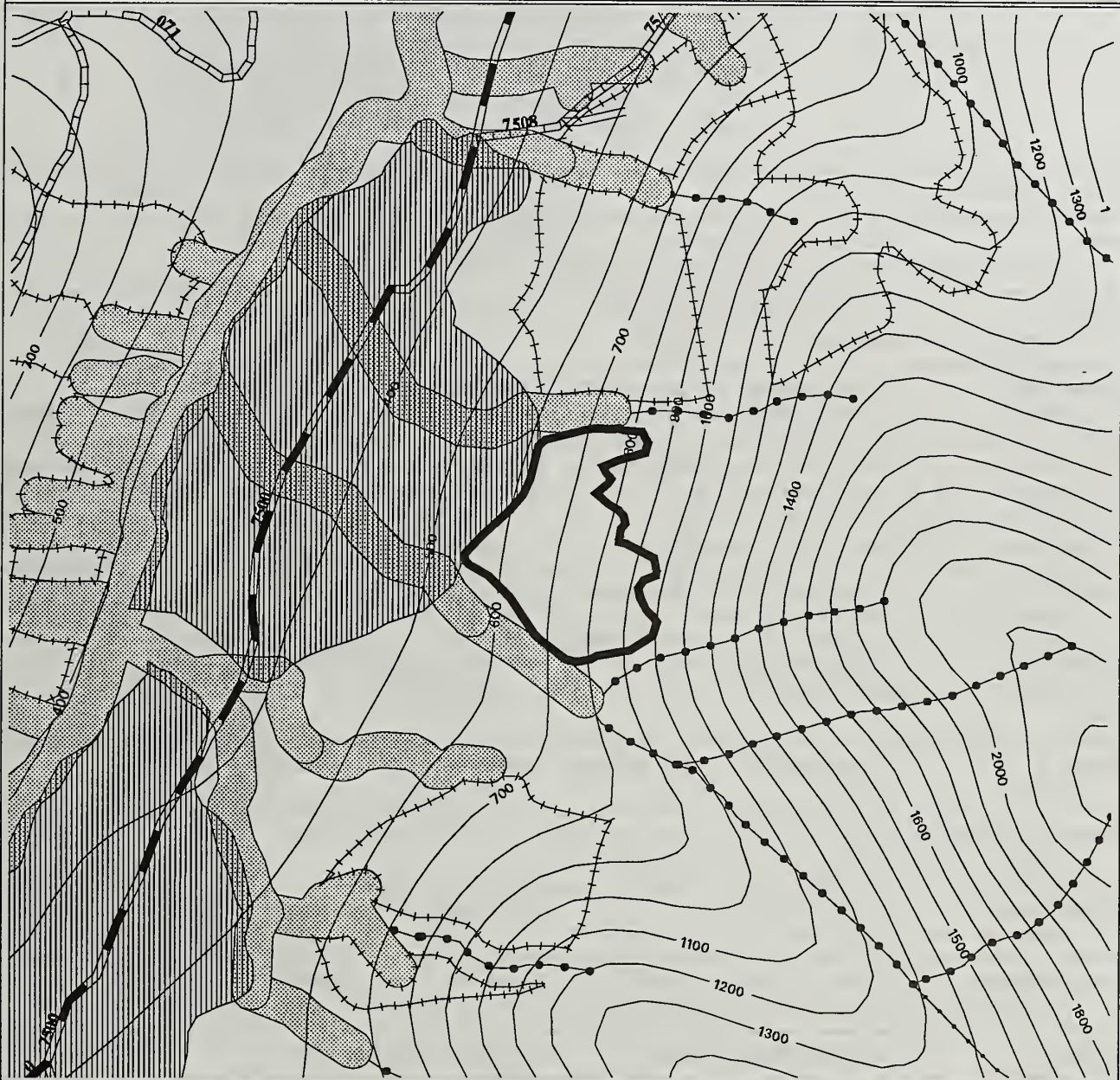
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	305	Helicopter	Clearcut w/ retention
C	90	289	Helicopter	Clearcut w/ retention
D	90	289	Helicopter	Clearcut w/ retention
E	90	289	Helicopter	Clearcut w/ retention
F	90	289	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a for HC2 and HC3/AF1 channels along N and SW boundaries. Leave windfirm boundary; recommend placing unit boundary at or above slope break of Class III channels (2/3 rule).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to south side class II and class III. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: S.GODFREY	APPROVED BY: M.REGAN
REMARKS: Recommend clearcut, helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64110 QUAD(s): SITD4NW
 ACRES: 21 Unit 64110 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 64210
ACRES: 28.3

VCU: 2160
VOLUME (MBF): 488

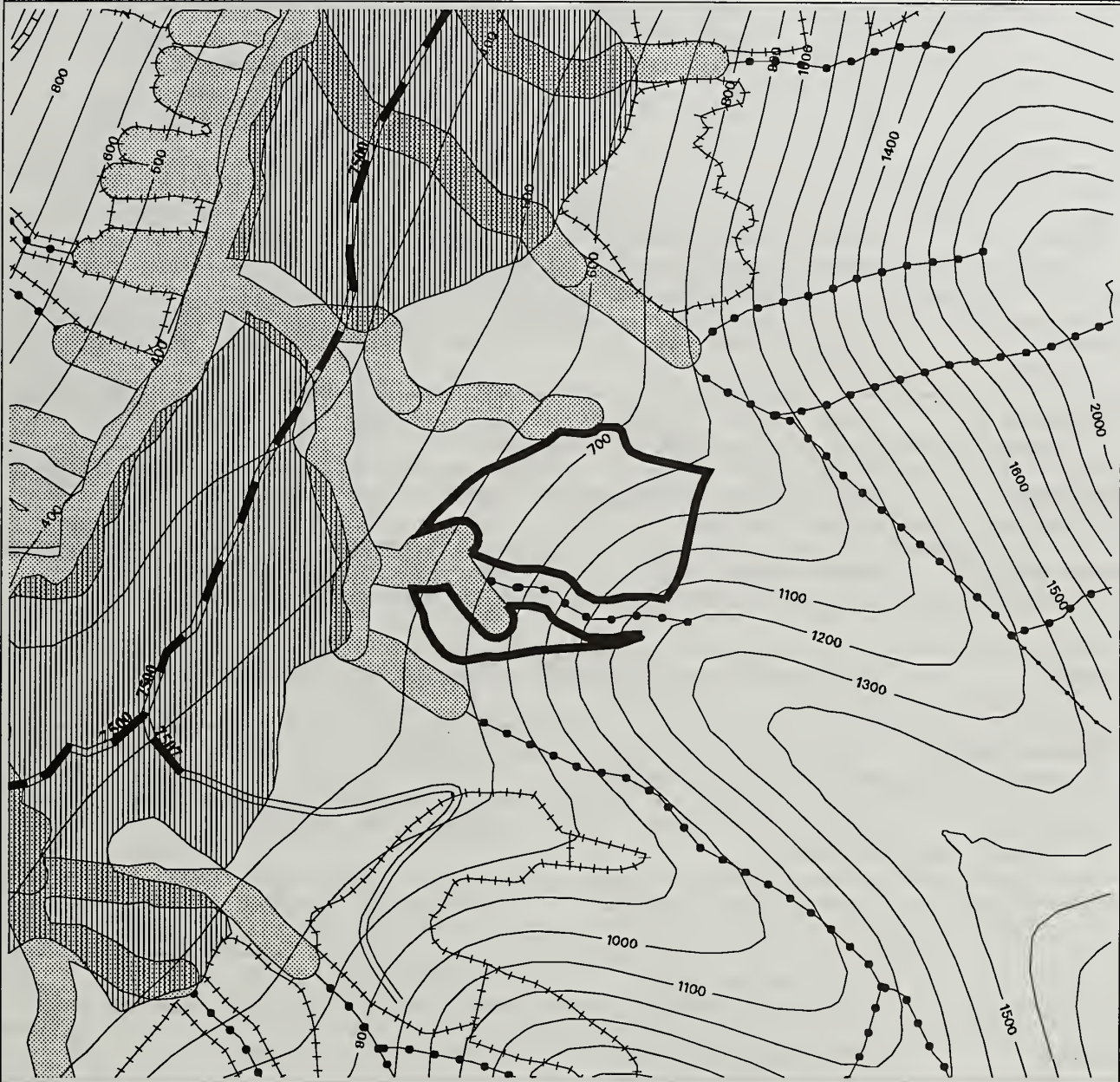
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	80	390	Helicopter	Overstory Removal
C	80	390	Helicopter	Overstory Removal
D	80	390	Helicopter	Overstory Removal
E	80	390	Helicopter	Overstory Removal
F	80	390	Helicopter	Overstory Removal

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Open forest/muskeg habitat. Low survey priority.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along lower NW, W, and S boundaries of unit. Maintain minimum of 100-ft buffer on Class II, Category A streams, as per BMP 12.6a. These include 3 FSO channels, and an HC3 channel. Upstream within and alongside unit, the FSO/HC6 channels are class III. The HC6 channel that splits the unit and the FSO channel on the N boundary are category B streams. Protect as per BMP 13.16 (and 13.3).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm leave strip to center class III stream. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend overstory removal, >16 inches DBH.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: Create windfirm leave strip along class 3 channel within unit.		
{ TIMBER }	FIELD REVIEW: B.BEALL	APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using overstory removal harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64210 QUAD(s): SITD4NW
 ACRES: 28 Unit 64210 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 64410
ACRES: 23.3

VCU: 2160
VOLUME (MBF): 425

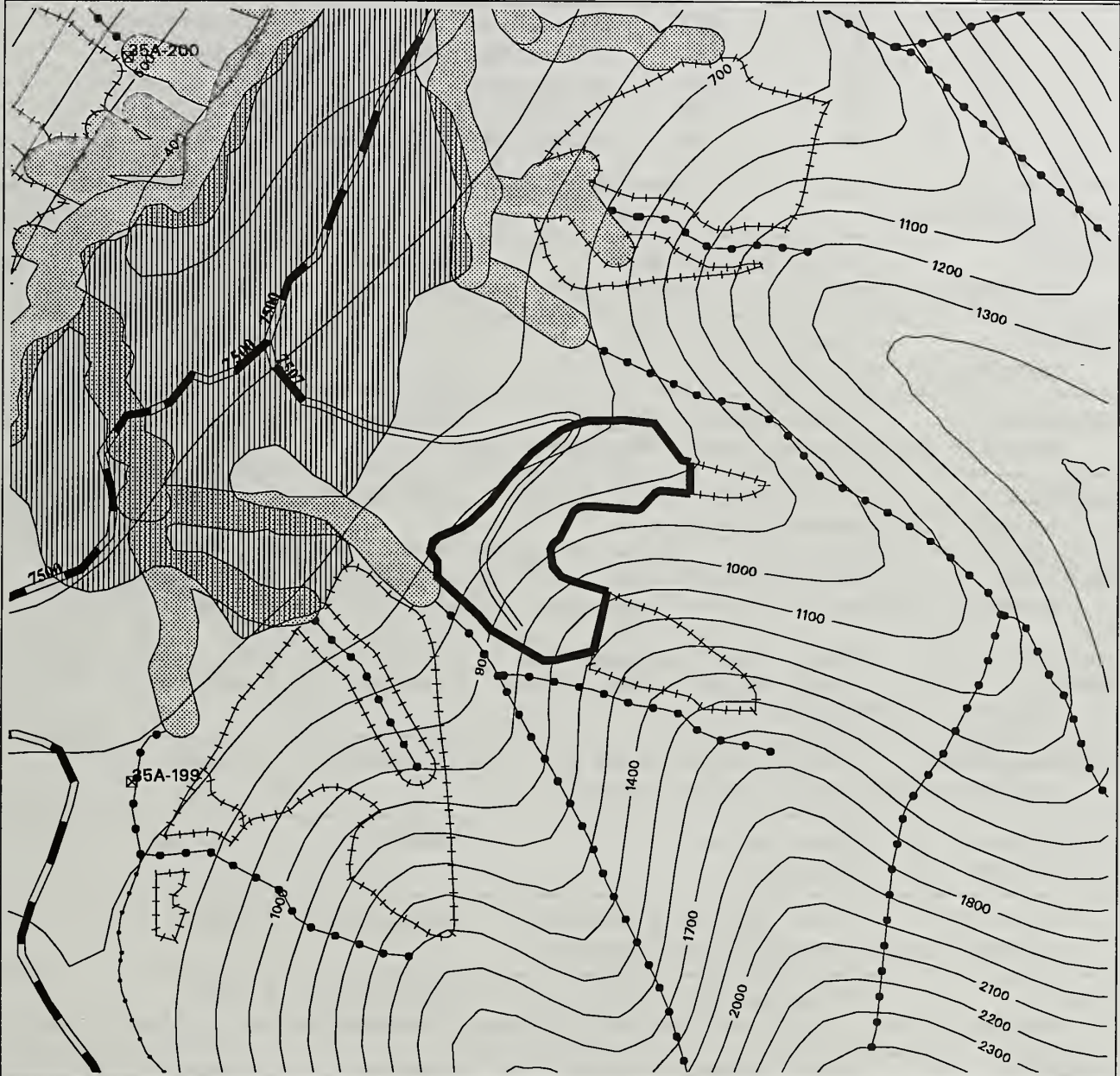
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	383	Cable	Clearcut w/ retention
C	90	383	Cable	Clearcut w/ retention
D	90	383	Cable	Clearcut w/ retention
E	90	383	Cable	Clearcut w/ retention
F	90	383	Cable	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.SHEPHARD	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants. Sensitive plants found on temporary road to unit. Recommend botanist present during layout for road.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: See soils and hydrology for remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm buffer on south side class III stream. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend clearcut.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary along class 3 channel on south side of unit.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: Recommend cable system.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64410 QUAD(s): SITD4NW
 ACRES: 23 Unit 64410 Occurs in Alternatives: B C D E F



UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

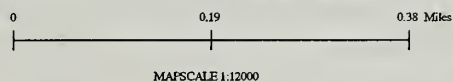
EAGLE TREE

EXISTING CLEARCUTS

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

100 FT CONTOUR INTERVAL



AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 64420
ACRES: 9.4

VCU: 2160
VOLUME (MBF): 172

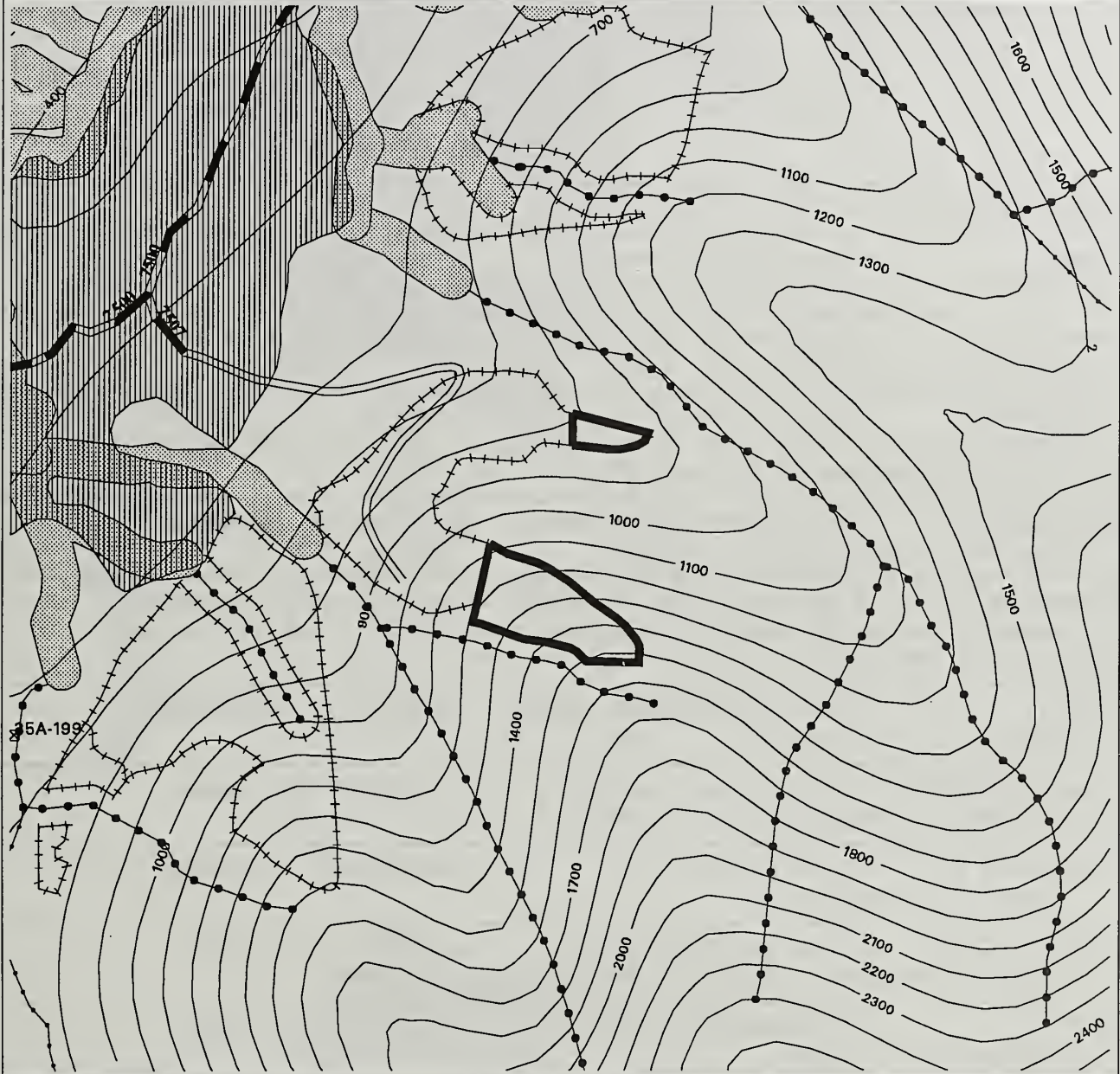
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	155	Helicopter	Clearcut w/ retention
C	90	155	Helicopter	Clearcut w/ retention
D	90	155	Helicopter	Clearcut w/ retention
E	90	155	Helicopter	Clearcut w/ retention
F	90	155	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: See hydrology and soils for remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary to class III stream. (BMP 12.6a; 13.16).		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend helicopter harvest.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on class 3 channel on south side of unit.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64420 QUAD(s): SITD4NW
 ACRES: 9 Unit 64420 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 64510
ACRES: 32.8

VCU: 2160
VOLUME (MBF): 596

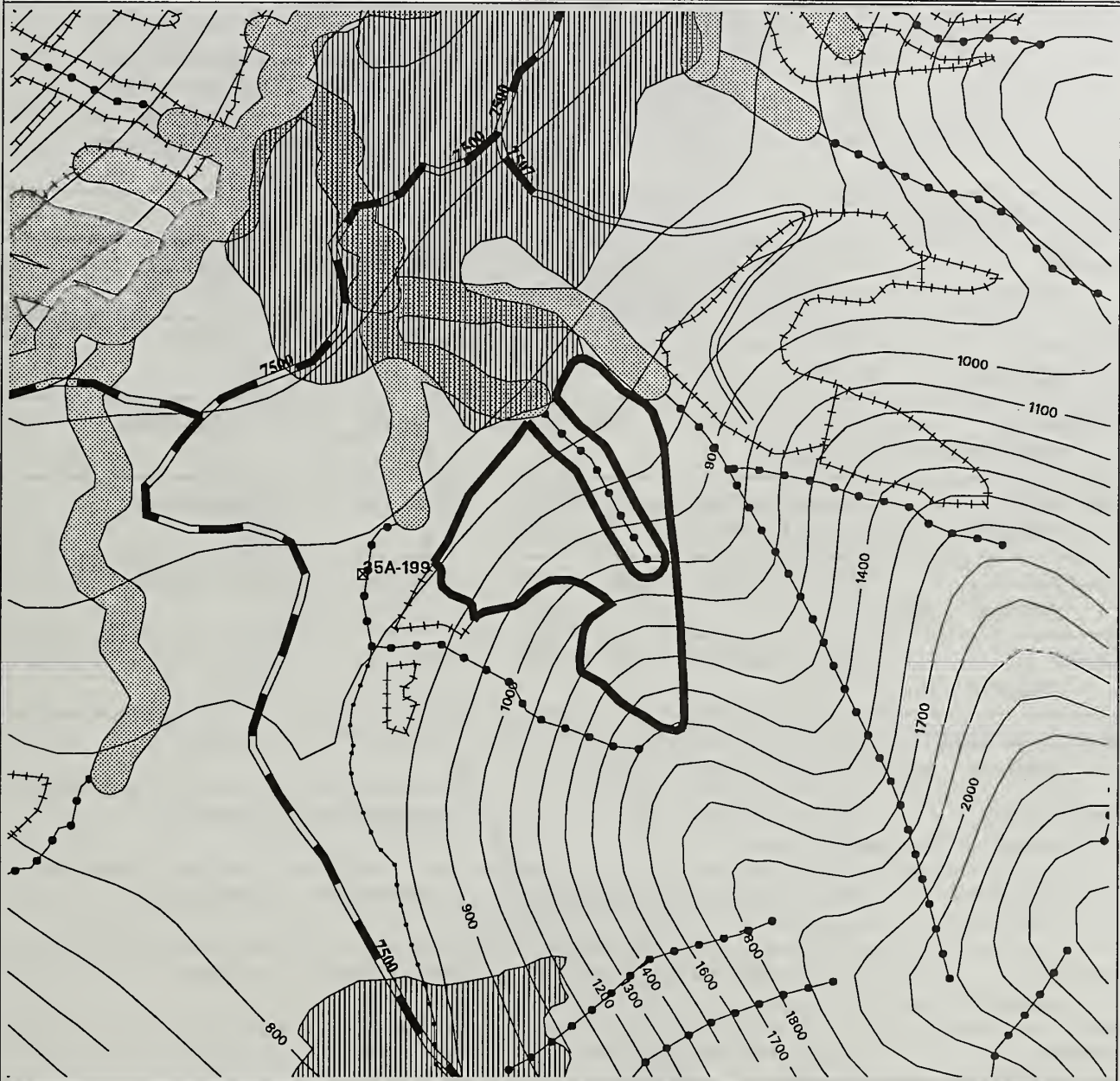
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	80	477	Helicopter	Overstory Removal
C	80	477	Helicopter	Overstory Removal
D	80	477	Helicopter	Overstory Removal
E	80	477	Helicopter	Overstory Removal
F	80	477	Helicopter	Overstory Removal

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Protect HC6, class III, category B channels along boundaries and within unit, as per BMP 13.16 (and 13.3).		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm leave strip to center class III stream (feathering). BMP 12.6a; 13.16.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: Recommend overstory removal, >16 inches DBH.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: Recommend helicopter harvest.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using overstory removal harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64510 QUAD(s): SITD4NW
 ACRES: 33 Unit 64510 Occurs in Alternatives: **B C D E F**



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAP SCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



INDIAN RIVER UNIT CARD

UNIT: 64530
ACRES: 3.4

VCU: 2160
VOLUME (MBF): 56

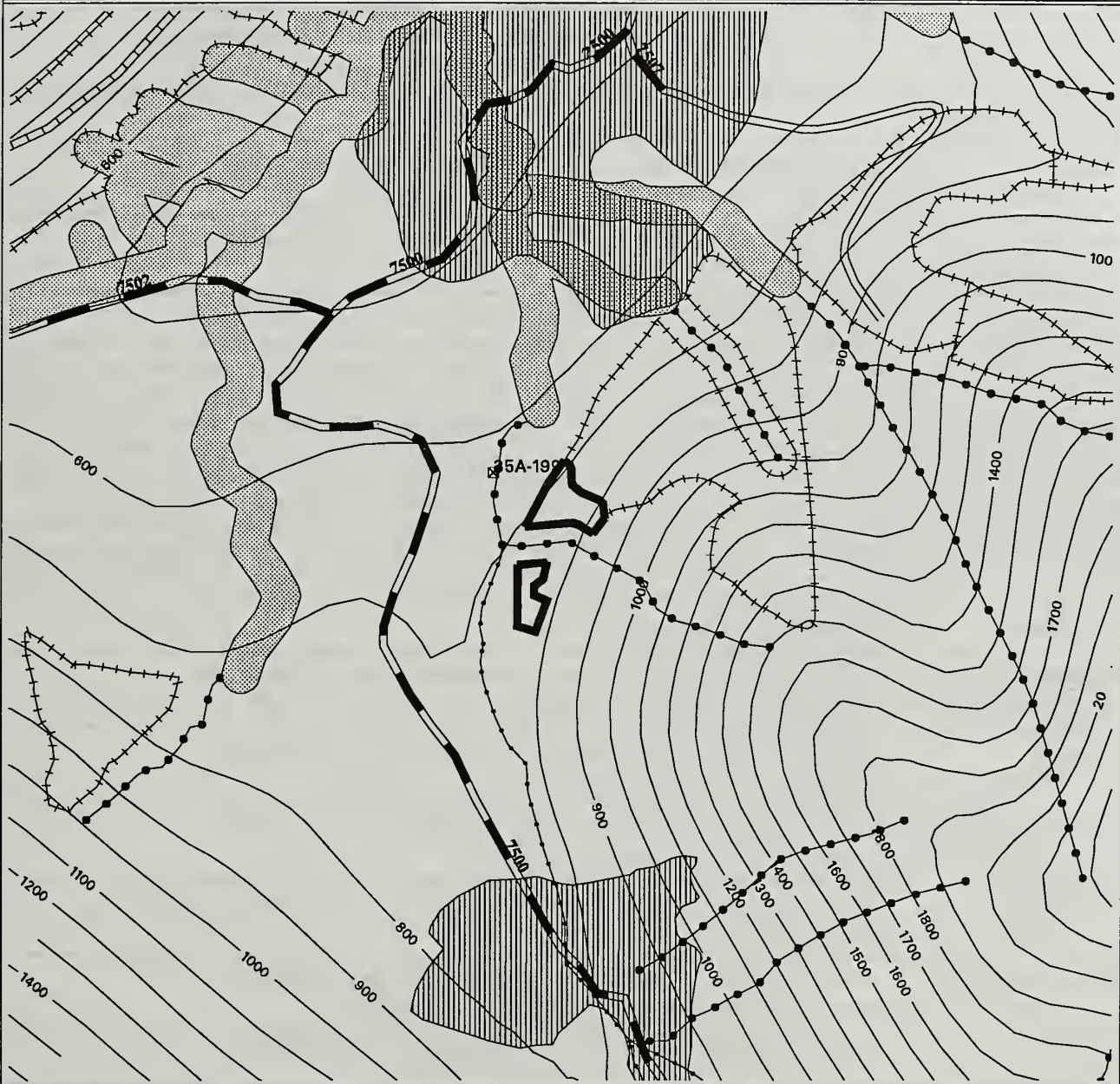
ALTERNATIVE SUMMARY				
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90	50	Helicopter	Clearcut w/ retention
C	90	50	Helicopter	Clearcut w/ retention
D	90	50	Helicopter	Clearcut w/ retention
E	90	50	Helicopter	Clearcut w/ retention
F	90	50	Helicopter	Clearcut w/ retention

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: YES	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: No concerns.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: BMP 13.16.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: S.BEALL	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: L.WINN	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW:	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: NONE	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).		

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64530 QUAD(s): SITD4NW
 ACRES: 3 Unit 64530 Occurs in Alternatives: B C D E F



AREA LOCATOR

UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



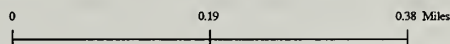
SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



100 FT CONTOUR INTERVAL



MAP SCALE 1:12000



INDIAN RIVER UNIT CARD

UNIT: 65013
ACRES: 12.8

VCU: 2160
VOLUME (MBF): 255

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	90	230	Helicopter	Clearcut w/ retention
D	90	230	Helicopter	Clearcut w/ retention
E	90	230	Helicopter	Clearcut w/ retention
F	90	230	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams, including upstream end of Class II habitat on smaller footslope (FSO) channels on either side of smaller N block, and on larger HC2/HC6 channels on either side of the larger S block. Implement 170 ft wide riparian conservation zones along valley bottom FP4 channel. Maintain windfirm (minimum of 100 ft) buffer on class I and II, category A stream(s) as per BMP 12.6a. Recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm. HC2/HC6 channels that extend uphill on either side of larger SW block are class III category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm buffer to class III streams. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: K.RUTLEDGE APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD

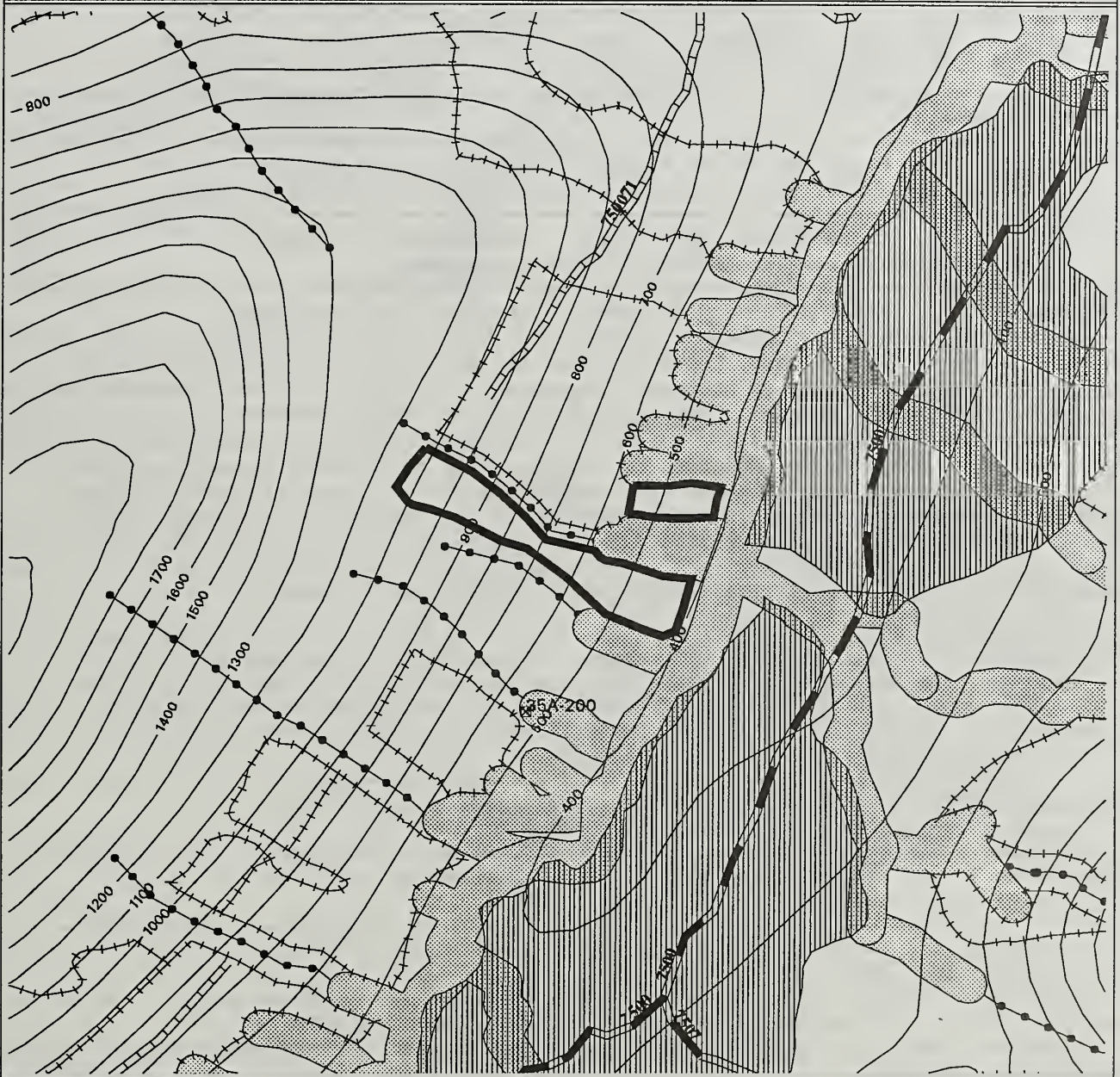
PLANNED HARVEST UNIT MAP

VCU: 2160UNIT NUMBER: 65013

QUAD(s): SITD4NW

ACRES: 13

Unit 65013 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

AREA LOCATOR

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD

TEMPORARY ROAD

EXISTING SPEC. ROAD

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

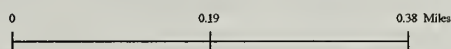
EXISTING CLEARCUTS

SALTWATER AND LAKES

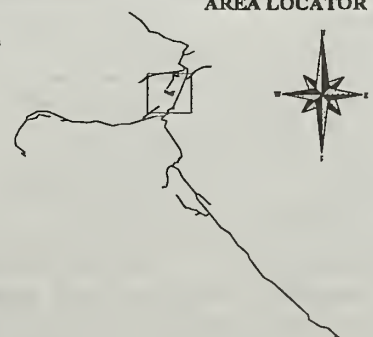
CLASS I & II STREAM BUFFER

☒

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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MAPSCALE 1:12000



INDIAN RIVER UNIT CARD

UNIT: 65020
ACRES: 62.8

VCU: 2160
VOLUME (MBF): 1072

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	90	965	Cable	Clearcut w/ retention
D	90	965	Cable	Clearcut w/ retention
E	90	965	Cable	Clearcut w/ retention
F	90	965	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPARD APPROVED BY: S.TRULL
REMARKS: Alpine/subalpine habitat. No sensitive plants found in survey.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife travel corridors.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including upstream end of class II habitat on 8 FSO channels all along the lower SE boundary. Implement 170 ft wide riparian conservation zones along valley bottom FP4 channel. Maintain windfirm (minimum of 100 ft) buffer on class I and II, category A stream(s) as per BMP 12.6a; recommend feathering (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm. Keep lower SW unit boundary uphill of class II channels where possible to increase windfirmness of stream buffers. FSO channels that extend uphill of class II habitat are mostly class III, category C streams. Protect as per BMP 13.16, 13.3.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundary on south side v-notch. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Specialist needed during layout. Leave windfirm boundary on class 3 channel on south side of unit.

{ TIMBER } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: K.RUTLEDGE APPROVED BY: L.SHIPLEY
REMARKS: Buffers and unharvested areas provide suitable travel corridors. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c).

INDIAN RIVER PROJECT HARVEST UNIT CARD

PLANNED HARVEST UNIT MAP

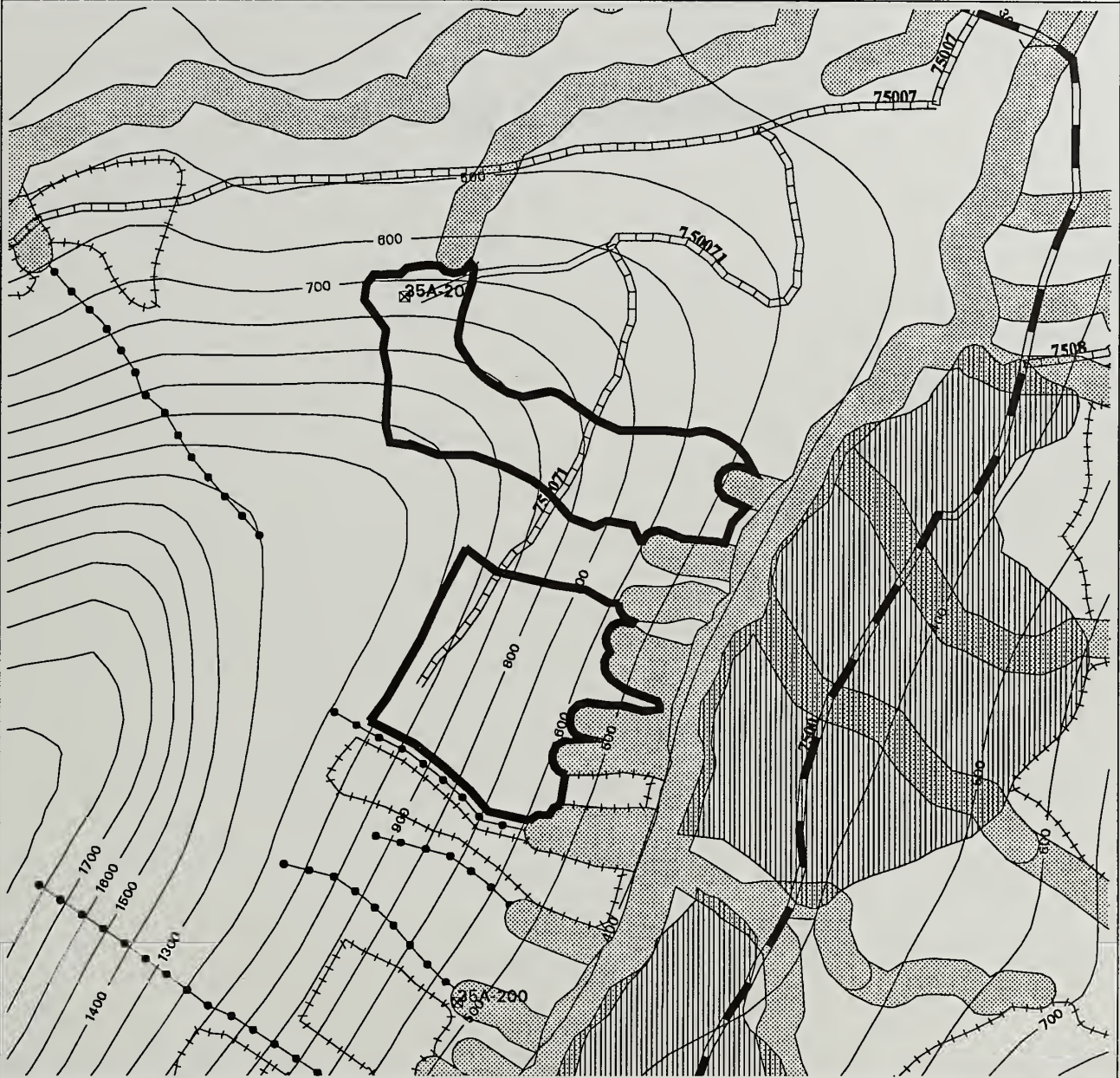
VCU: 2160

UNIT NUMBER: 65020

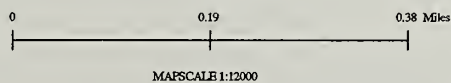
QUAD(s): SITD4NW

ACRES: 63

Unit 65020 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL



AREA LOCATOR



UNIT BOUNDARY



ADJACENT UNIT



NEW SPEC. ROAD



TEMPORARY ROAD



EXISTING SPEC. ROAD



CLASS II STREAM



CLASS III STREAM



PHOTO POINT



EAGLE TREE



EXISTING CLEARCUTS



SALTWATER AND LAKES



CLASS I & II STREAM BUFFER



Appendix K

LTF Siting Guidelines

REPORT

ON THE

LTF SITING, CONSTRUCTION AND OPERATION , AND MONITORING AND REPORTING GUIDELINES*

SITING GUIDELINES

1. Proximity to Rearing and Spawning Areas: Siting of log transfer and log raft storage facilities within 300 feet of the mouths of anadromous fish streams, or in areas known to be important for fish spawning or rearing, is normally prohibited.
2. Protected Locations: Log transfer and log raft storage facilities should be sited in weather-protected waters with bottoms suitable for anchoring and with at least 20 acres for temporary log storage and log booming.
3. Upland Facility Requirements: Log transfer facilities generally should be sited in proximity to at least five acres of relatively flat uplands. There should also be a body of water sufficient to provide a minimum of 60 lineal feet of facility face.
4. Safe Access to a Facility from the Uplands: To provide safe access to the log transfer facility and adjoining log sort yard, the facility should be sited where access roads to the facility can maintain a grade of 10% or less for trucks and 4% for specialized equipment.
5. Bark Dispersal: Log transfer facilities should be sited along or adjacent to straits and channels or deep bays where currents may be strong enough to disperse sunken or floating wood debris. Siting log transfer facilities in embayments with sills or other natural restrictions to tidal exchange should be avoided.
6. Site Productivity: Sites for in-water storage and/or transfer of logs should be located in areas having the least productive intertidal and subtidal zones.
7. Sensitive Habitat: Log transfer facilities and log raft storage areas should not be sited on or adjacent to (i.e., near enough to affect) extensive tideflats, salt marshes, kelp or eelgrass beds, seaweed harvest areas or shellfish concentration areas.
8. Safe Marine Access to Facilities: Log rafting and storage facilities should be safely accessible to tug boats with log rafts at most tides and on most winter days.
9. Storage and Rafting: Logs, log bundles, and log rafts should be stored in areas where they will not ground at low tide. A minimum depth of 40 feet or deeper measures at mean lower low water (mllw) for log raft storage is preferred.
10. Avoid Bald Eagle Nest Trees: Site log transfer facilities to avoid bald eagle nests. No project construction or operations should be closer than 330 feet to any bald eagle nest tree.

* Guidelines prepared by the Alaska Timber Task Force Log Transfer Facility Guidelines Technical Subcommittee (1985).

LTF SITING, CONSTRUCTION AND OPERATION , AND MONITORING AND REPORTING GUIDELINES*	
CONSTRUCTION AND OPERATION GUIDELINES	
1.	<u>Log Transfer Facility Design:</u> Log transfer facility design should be the least environmentally damaging, practicable alternative. Factors to be considered in selection of design alternatives include: 1) economic practicality; 2) facility requirements; 3) physical site constraints; 4) timber volumes to be transferred (site usage and duration); 5) total potential effects on biota and water quality (including biological productivity and sensitivity); and 6) other potential uses of the site and facility.
2.	<u>Fill Structures:</u> Fill structures shall be designed and constructed to prevent erosion, pollution and structural displacement.
3.	<u>Timing of Inwater Construction:</u> Inwater construction, blasting, and filling associated with LTF sites should be timed to limit adverse impacts to marine and estuarine fishery resources and avoid conflicts with other user groups.
4.	<u>Bark Accumulation Management:</u> The siting, design, and operation of the LTF and contiguous collateral upland facilities shall utilize best practicable procedures and methodologies to control intertidal and submarine accumulations of bark.
5.	<u>Solid Waste Management:</u> Solid waste, including wood and other solid waste generated from the LTF, contiguous facilities and other collateral facilities shall be routinely removed from the log transfer facilities and adjacent facilities and disposed of at an approved upland solid waste disposal site.
6.	<u>Bark Accumulation:</u> The regulatory agency(ies) will impose an interim intertidal and submarine threshold bark accumulation level. When accumulations exceed the threshold level, cleanup - if any - will occur at the discretion of the permitting agency(ies). The interim threshold bark accumulation level is described as 100% coverage exceeding both 1 acre in size and a thickness greater than 10 cm (3.9 inches) at any point.
7.	<u>Bundle Speed:</u> The speed of log bundles entering receiving waters should be the slowest practicable speed achievable. Decisions on the allowable transfer system that can be used will occur on a site-specific basis during the permitting process.
8.	<u>Surface Drainage Management:</u> The design, construction, and operation of LTFs, contiguous sort yards, and log storage yards shall utilize practicable procedures for control of surface water runoff from facilities.
9.	<u>Control of Hydrocarbons:</u> The log transfer system and adjacent sort yard handling equipment shall be operated and maintained to minimize petroleum and lubricating products from entering waters.
10.	<u>Onshore Log Storage:</u> Where feasible, preference must be given to onshore storage and barging of logs.
11.	<u>Facility Maintenance and Reclamation:</u> The permittee shall maintain the structure or work authorized in good condition and in reasonable accordance with the approved plans and drawings. If and when the permittee desires to abandon the authorized activity herein, unless such abandonment is part of a transfer procedure by which the permittee is transferring its interests to a third party, the permittee must restore the area to a satisfactory condition.
* Guidelines prepared by the Alaska Timber Task Force Log Transfer Facility Guidelines Technical Subcommittee (1985).	

LTF SITING, CONSTRUCTION AND OPERATION , AND MONITORING AND REPORTING GUIDELINES*

MONITORING AND REPORTING GUIDELINES

1. Monitoring by Permittee: Monitoring for bark accumulations, oil sheen, and surface runoff associated with the operation of log transfer facilities is the responsibility of the permittee. The regulatory agencies may, at their discretion, be responsible for some or all monitoring requirements.
2. Monitoring Requirements: Monitoring should be undertaken at all continuous- and intermittent-use LTF sites, and at those occasional- and incidental-use LTFs at which total volume of logs transferred is similar to that of intermittent-use sites. The level of monitoring and parameters to be monitored should be determined on a site-specific basis. Monitoring at occasional- and incidental-use facilities may be required on a site specific basis. The need for monitoring of occasional- or incidental-use sites will be limited. Permittees will be required to submit a monitoring program to the permitting agencies prior to operation of a new continuous- or intermittent-use LTF. Agency approval of monitoring plans is required. Requirements for monitoring should be responsive to data obtained during prior monitoring activities.
3. Annual Monitoring for Bark Accumulation: At continuous- and intermittent-use LTFs, monitoring of bark debris accumulation should occur prior to the operating season as a minimum requirement. Monitoring at intermittent LTFs would occur only during those periods when the LTF is active.
4. Elements of Bark Accumulation Monitoring Program: Elements that should be included in a monitoring program for continuous- and intermittent-use LTFs are site-specific and may include but not be limited to:
 - a. permanent transects
 - b. measurements of areal extent, thickness and percent coverage of bark debris
 - c. measurements (a) and (b) are from mean high water to depths of 60 feet mllw.
5. Monitoring for Oil Sheen: Waters in the vicinity of an LTF shall be monitored during operations for the presence of a visible sheen and the presence of sheens shall be recorded when observed.
6. Monitoring Upland Discharges: On a case-by-case basis, discharges of rainfall runoff from the log sorting and storage yard and discharges from any settling pond used to treat water may require monitoring to ensure compliance with State Water Quality Standards and the Clean Water Act.
7. Reporting Guidelines: Routine annual reports include the following descriptive information:
 - a. Location of LTF (402/404 permits require latitude and longitude; Forest Service traditionally uses legal descriptions).
 - b. Description of LTF, including transfer devices and sorting and storage areas.
 - c. Permit holder and/or operator of LTF.
 - d. Starting and ending dates of operating season (from first to last bundle), and number of operating days per season.
 - e. Gross volume in board feet (Scribner Scale) or number of bundles transferred during the operating season.
 - f. Monitoring data described in the monitoring guidelines.

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